

The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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The Hege Improved Saw-Mill.

The Salem Iron Works, of Salem, N. C., are building an improved form of saw-mill, in which an entirely new device has been adopted for operating the set works. The engravings which we give below, together with the details on page 9, will explain the general design. Instead of using two or more head-blocks, with uprights acting independently or simultaneously, as with screw-head blocks and some lever sets, a sufficient

racks on the other side of the groove are connected together in the same way. A pinion, A, for each set of racks, which is shown in the cut, is of proper size to gear into the racks on both sides of the groove at the same time, and extends far enough below to also gear firmly into the rack on the side of the head-block underneath. In one of these pinions is secured one end of a shaft, which extends upward through the log-beam to the top of a dial-plate (see Fig. 4, on page 9), where the end is se-

holes for stop pins so that the ratchet-wheel may be moved any distance desired, from $\frac{1}{8}$ to $\frac{1}{4}$ around, by one stroke of the lever, which will move the log-beam from $\frac{1}{8}$ inch to 2 inches. When the stops are set for any particular thickness of lumber, and the lever is moved the full distance between the stops, it will always move the log-beam the same distance. The lever by which the ratchet-wheel is turned is easily moved by the sawyer, even when there is a heavy log on the carriage. Fig. 3 is a front view of

chains, composed of what we should call eye-bars, each link containing six eye-bars, so that each pin connection passed through 12 eyes. This must have been originally an excellent arrangement, such chains being flexible enough for their purpose, and not liable to some of the obscure defects of ropes, while they would be much more easily inspected than wire cables. In fact, inspection of a certain sort seems to have been regularly given them, and two years ago the municipal officers, who were naturally anxious

precision, and the condition of the bridge as shown after the accident was quite bad enough to account for the catastrophe independent of vibrations. Instead of the "good condition" in which the "experts" reported that they had found the ironwork, eleven out of the twelve eye-bars composing the broken double chain were found to have lost five-sixths of their substance by rust; the metallic section of each eye-bar remaining being, on an average, one-tenth of an inch thick; while the twelfth member, of the

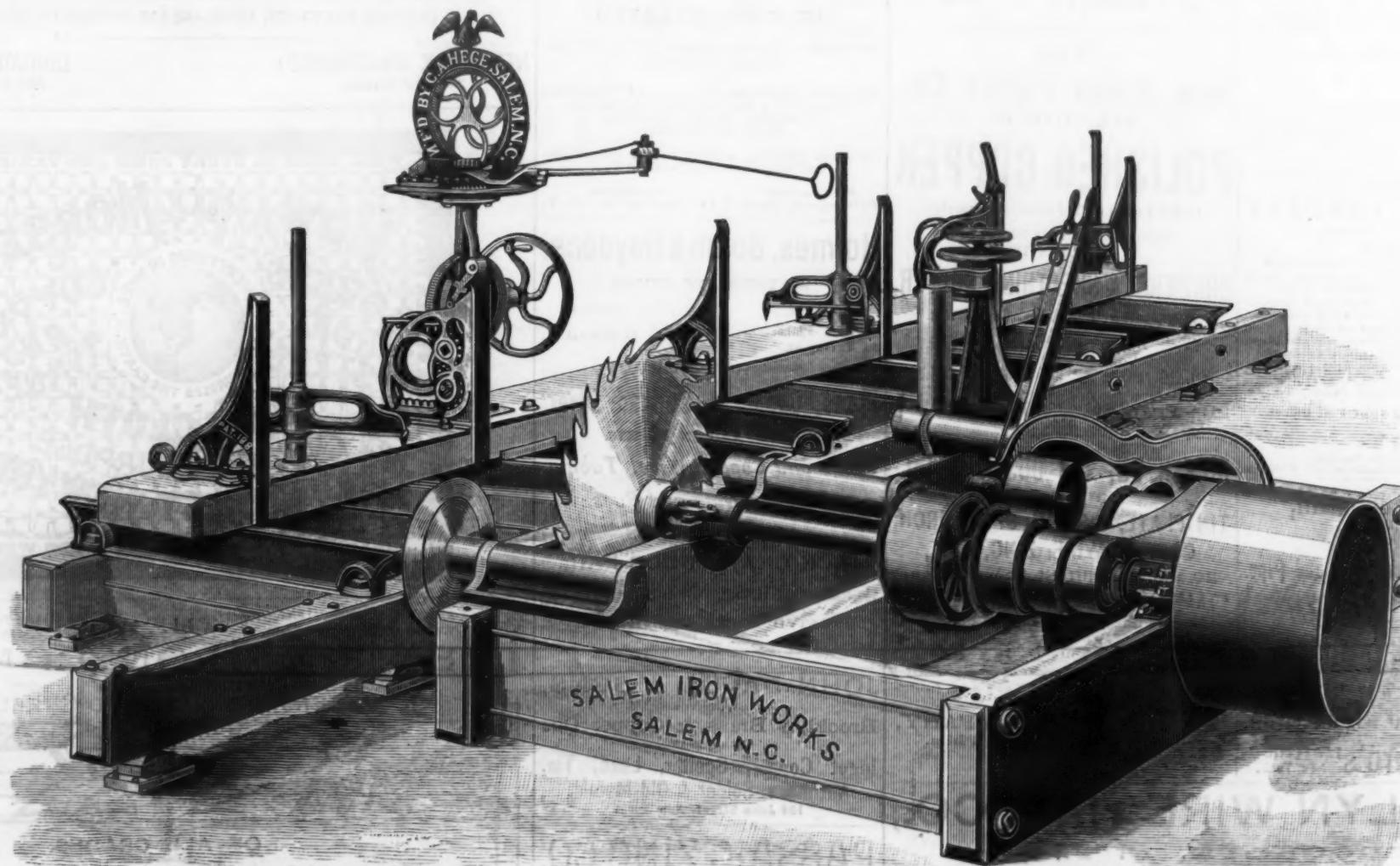


Fig. 1.—General View.

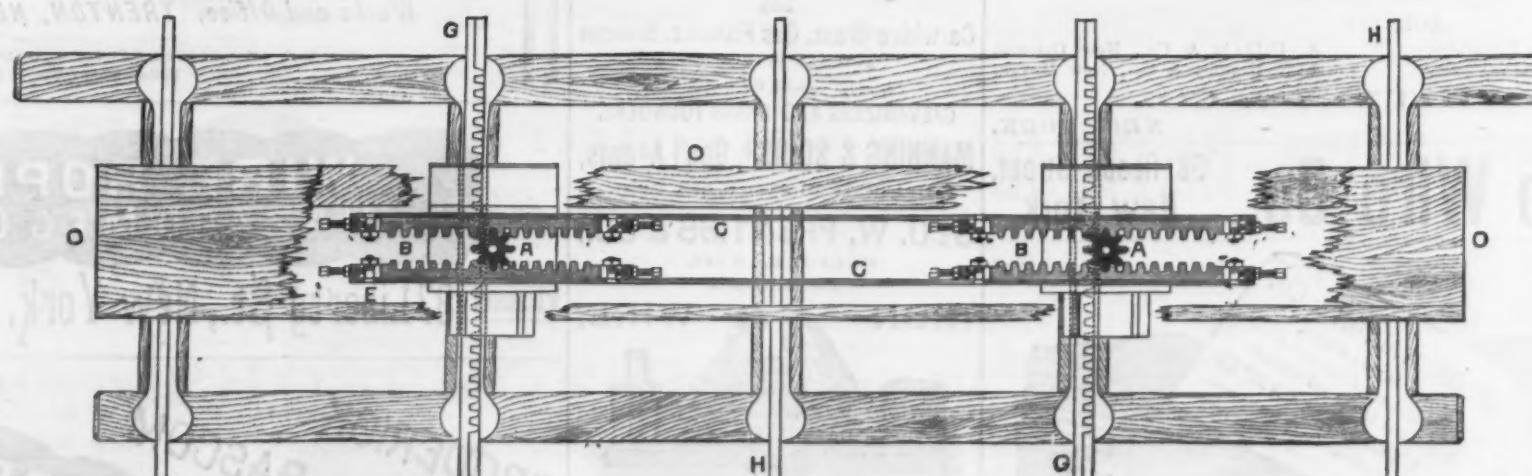


Fig. 2.—Sectional Plan of Set Works.

(For Figs. 3 and 4 see page 9.)

IMPROVED 25-FOOT SAW-MILL, BUILT BY THE SALEM IRON WORKS, SALEM, N. C.

number of head-blocks are provided, and placed across the carriage at intervals of 4 or 5 feet throughout its entire length. Upon these is a long bar or slide of wood, to which are rigidly fastened the cast iron uprights or knees for the log to rest against. Two or more of the head-blocks, at suitable distances from each other, are provided with racks extending their entire length on one side, as shown in Fig. 2. In the underside of the wooden slide or log-beam is a groove running its entire length. In this groove are arranged racks B B on each side, and so placed that when the log beam O is about the middle of the carriage the center of each set of racks will be directly over the racks on the head-blocks G G.

Both of the racks on one side of the groove are connected by a strong bar of wrought iron, C, so that as one rack is pulled endwise, the other rack on the same side must move exactly the same distance. The two

cured in a ratchet-wheel. This ratchet-wheel may be turned in either direction by the lever and pawl, thus giving motion to the pinion below. This pinion, through the racks in the groove in log-beam, moves the other pinion in the same direction, and exactly the same distance that it is moved; and both pinions being geared into the racks on the side of the head-blocks across the carriage, any motion given to them must cause the log-beam to move across the carriage, both ends of it moving at the same instant and precisely the same distance, as it is impossible to spring a strong bar of iron by pulling it lengthwise. There are eight coggs on each pinion, and on the racks across the carriage there is one cog to every inch. By turning the ratchet-wheel one-eighth around, the log-beam will be moved just one inch.

It will be noticed from Fig. 4 that the dial plate is graduated and is furnished with

the pointer on top of the dial-plate. With this log-beam in use, the log, while being sawed, is braced and supported every few feet, and at the same time, is held firmly by the self-adjusting dogs, so that there is no possible chance for it to spring. The mill is furnished with friction feed, and, according to present reports, is meeting with a ready sale throughout the country.

Fall of a Suspension Bridge in Germany.

The American Architect records a singular accident which took place not long ago in Germany, recalling, in some respects, the fall of the Bussey Bridge in Massachusetts. A suspension bridge was built in 1851 across the river Ostravitz, between Ostrau in Moravia, and its suburb in Silesia. Instead of ropes, the bridge was sustained by four

about the condition of an iron bridge 34 years old, ordered a special examination by experts. A month later they received notice that the bridge had been inspected in every part, and had been ascertained to be in good condition and was entirely safe. Reassured by this "inconceivable report," as *Le Genie Civil* well calls it, the town authorities allowed it to be freely used, and on at least one occasion this spring there were more than 300 persons on it at once. A few days later, when two carriages, ten persons, and a file of cavalry soldiers, 16 in all, were on the bridge, the suspending chains on one side broke, letting the bridge fall, and killing or wounding a large part of the people on it. There is some reason to suppose that, as in the case of the fall of the famous suspension bridge at Angers, the final strain may have been due to the vibration caused by the measured march of the cavalry, but horses do not often keep step with mathematical

group was found completely rusted and covered with dust in the spot where it had lodged when it dropped, long before, from its place. Of course, a wrought-iron structure, even if originally designed with a factor of safety much larger than usual, would be in imminent danger of falling by its own weight when rust had consumed more than five-sixths of its substance, and a simple calculation showed that the strain on the sound metal at the time of the fall was more than the breaking strain of good wrought-iron; so that the real wonder is that the bridge stayed up so long. The most serious corrosion, strange to say, was found to be under cover, where the chains were anchored on the land side in a chamber of masonry under the parapet; but it seems that foul water from the street had penetrated into this chamber, giving rise, possibly, to acids which would act very powerfully on iron.

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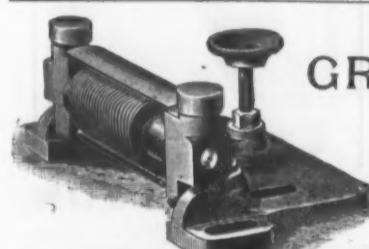
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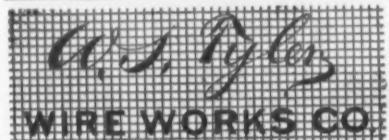
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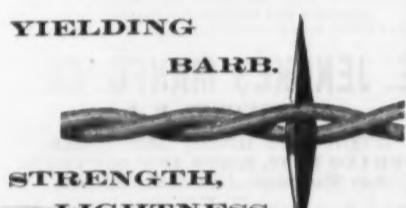
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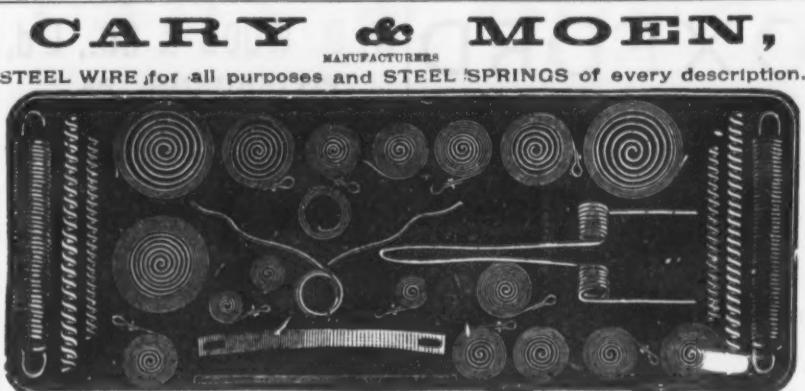
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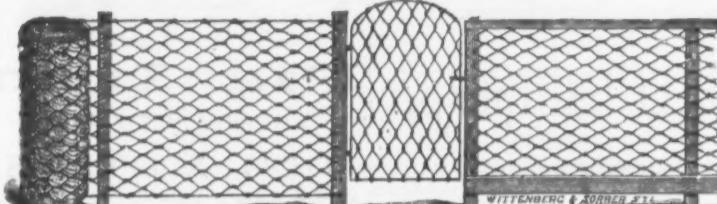
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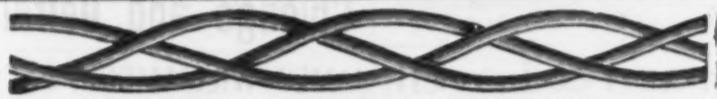
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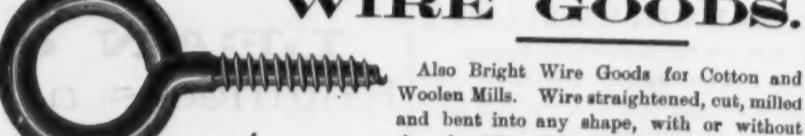
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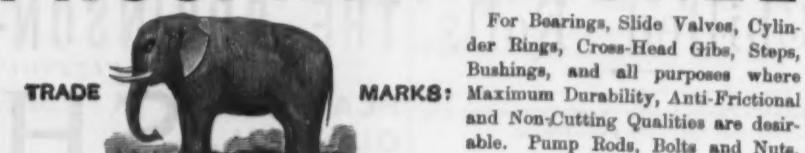
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Clock Springs and Small Springs
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The Oldest and Most Extensive Manufacturers of
Pumps, Hydraulic Rams, Garden Engines,
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Fig. 130.



Fig. 130.



Fig. 70.



WROUGHT STEEL SINKS.



One of the strong points of these sinks is the new coupling with which they are now supplied, and which is pronounced by all plumbers the best on the market. It is used with both lead and wrought-iron pipe; is a neat, reliable joint, and easily done for the purpose of pumping up the pipes. The strainer and all parts of the coupling are tinned, and are furnished with all sinks without extra charge.

The fact of the great strength and durability of this sink, as it is practically free from danger of breakage in transportation, handling or use, is a strong point in its favor, and that its merits are recognized by most competent judges is evident from the fact that nothing which has been interested in the common article has taken up the Wrought Steel Sink. Twenty-five per cent. is saved in freight by purchasing Steel Sinks. Orders come from all parts of the United States, Canada, Europe and Australia.

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Plain and Ornamental Butts, Single and Double Acting Spring Hinges, Union Collar Door Springs, Galvanized Pump Chain, Patent Rubber Buckets, Wooden Well Curbs, Wood Tubing, Iron and Brass Pumps. Patent Copper Pumps, Hydraulic Rams, Power Pumps, &c., &c., &c.

FIG. 114. FIG. 114 REPRESENTS OUR
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RRINGTON & RICHARDSON'S
New Automatic Double-Action REVOLVER.



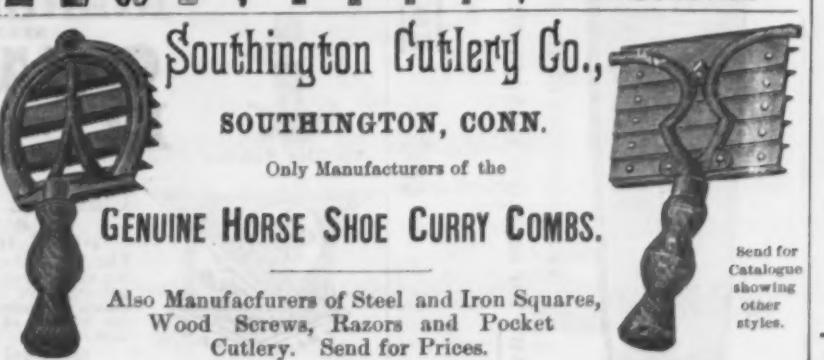
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Hollow Handle
TOOL SETS.

This Handle is made of Cocobolo wood, highly finished, with Jaws, Clamping Nut, and Ferule Nickel-Plated. Tools, 10 in number, are of Tool Cast Steel, properly hardened and tempered. List, \$1.00 per doz. For sale by the Hardware Dealers, or will mail to any address on receipt of \$1.00.

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SCREW WRENCHES,

The Strongest Wrench made, and the only successful re-enforced bar. The Ferrule firmly secured in place by a nut screwed on the bar.

Particular attention is called to the way in which the handle is made and fastened to the shank.

This Handle is made better and stronger than heretofore by using our new Cup Tip at the end which encloses the wood and keeps it from splitting. This is the only wrench which has the wood handle firmly secured and held together at each end, and it will stand more rough usage and last longer than any now made. It is not affected by heat, cold or moisture.

None Genuine unless Stamped,

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Warehouse:
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PATENT COMBINATION WRENCH.

Case-Hardened Throughout. Parts Interchangeable.

This Wrench not only combines the superior qualities of a Gas Pipe Wrench but also all the requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.



No. 3 PATENT PIPE WRENCH.

The serrated jaws of the Wrench are interchangeable; that is, the same serrated plate may be used for both jaws. The jaws of the Wrench are so constructed that they can be turned and adapted to either jaw with out any disengagement. The various nuts and various parts are also interchangeable, thus easily repairing the Wrench at very small expense, and with as perfect practicability for further use as when the Wrench was new.

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Write for Prices and Discounts.

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Adams Swing.

The popularity of the Adams Swing in the short time it has been introduced is phenomenal.

The Swing is constructed on original mechanical principles, the frame is so interlocked as to be prevented from sagging, even if the bolts are loose, a feature not possessed by any other swing manufactured. There are two sizes manufactured, one for boy's larger swing, No. 1, or largest size, standards 9 feet to inches long, with a spread of about 9 feet, and 5 feet in width. The frame is so constructed that by taking out two bolts the standards will close up, and by taking out the heads of the two bolts the frame can be closely folded ready for shipping. The Swing can be put up or taken down ready for packing in 10 minutes.

The weight of the Swing is a little less than 100 pounds. It is very strong, having been tested by four men whose weight aggregated over 600 pounds.

The No. 2, or parlor size, has standards about 7 feet long, and otherwise is the same in size, weighing less than 75 pounds. They combine simplicity of construction, beauty and strength, and can be operated with ease by small children in the swing.

For Sale by all Leading Dealers.

CARRIAGE HARDWARE.



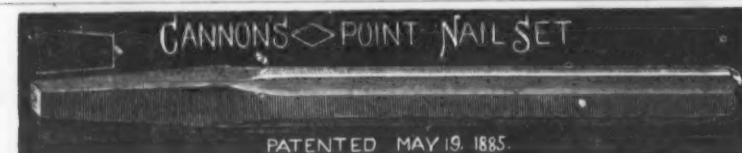
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Manufacture and keep in stock a full line of FILES and RASPS only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade. Superiority acknowledged wherever used, sold or exhibited.



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The object of this Diamond Point can be readily seen, in that it prevents the Set from slipping from the head of the nail while in use, thus saving in many cases some valuable piece of work.

IT IS FAST TAKING THE PLACE OF EVERY OTHER NAIL SET. ONCE SEEN MECHANICS WILL HAVE NO OTHER.

These Sets are carefully made from the BEST QUALITY OF TOOL STEEL. The Points are turned and thoroughly tempered, and will not break off.

EACH SET FULLY WARRANTED.

The Trade Supplied. Put up in Boxes $\frac{1}{2}$ Dozen, 1 Dozen, $\frac{1}{4}$ GROSS and 1 GROSS. Assorted Sizes. Prices and Terms upon application.

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PATENTED MAY 19, 1885.



This Knife is the BEST IN USE for cutting down hay and straw in mow and stack-cutting fine feed from bale, cutting corn stalks for feed, cutting peat & ditching marsh. The blade is Best Cast Steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export, as well as home trade, and it seems destined to take the place of all other Hay Knives. They are nicely packed in boxes, 1 dozen each of 60 pounds weight, suitable for shipping by land or water to any part of the world.

Manufactured only by

HIRAM HOLT & CO., EAST WILTON, FRANKLIN Co., MAINE.

For sale by the Hardware trade generally.

CAUTION.

We are informed that various parties are infringing upon the widely-known Letters Patent granted originally to GEORGE F. WEYMOUTH for an improved Hay Knife. The improvements made by G. F. Weymouth are embodied in the new and improved blade provided with operating handles for working the same, the edge of the sword-blade being furnished with knife-edged serrations or teeth. It is our purpose to PROSECUTE ALL INFRINGEMENTS, and to hold responsible to the full extent of our ability and of the law all parties who manufacture any knife infringing upon the patent, or who deal in the same. Several suits are now pending in the U. S. Courts. All manufacturers and dealers are hereby warned of our rights, and the public are cautioned against purchasing any Hay Knives, made as described above, which are not of our genuine manufacture.

East Wilton, Sept. 1, 1886.



W.H. CARTER'S PATENT NEEDLE HAY KNIFE.

PAT. APR. 29, 1884.
IMPROVED BY M.M. BARTLETT.
Improvement Patented April 28, 1885.

SOLE MANUFACTURERS OF
Carter's Improved NEEDLE HAY KNIFE,

Patented April 29, 1884.

Most celebrated knives of this kind, and has proved an easier and faster Cutter than any other. Its special excellence consists in the chisel-edged teeth, which may be used for cutting hay in the mow, stack and bale; also for ditching, cutting peat, or any other work for which a hay knife is used. It can be readily ground by the most inexperienced, as it requires to be ground only on one side. Should a tooth break, all that is necessary to replace the damage is to grind it once and a new chisel-tooth appears, can ordinarily be sharpened with a common scythe stone. Try one and you will give it the preference.

LARGE HEADS.

**CHAMPION
Horse Nails**

CITY HEADS.



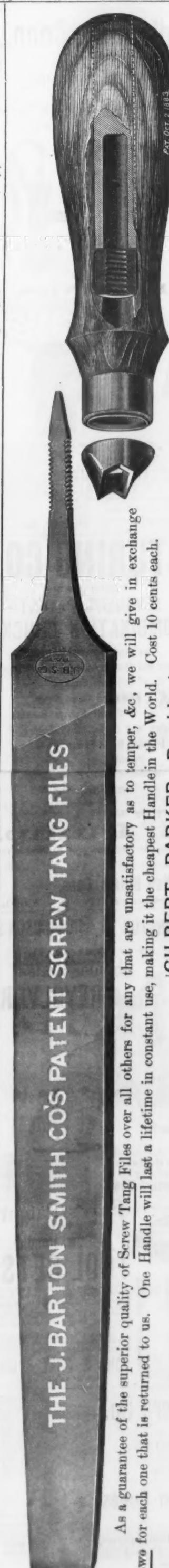
Manufactured from very best SWEDISH METAL. Will not SPLIT. Are accurately pointed, tough, strong and hold the shoe. Soft enough to clinch readily; stiff enough to drive without bending. All nails uniform and perfect. They are used in thousands of shops with the best of satisfaction, and are especially liked by "farmer-men" for their good, reliable driving. Made in two patterns, "LARGE HEADS" and "CITY HEADS."

QUALITY GUARANTEED.

LIST:

Nos. 4 5 6 7 8 9 10
50c. 25c. 25c. 25c. 25c. 25c. 25c.

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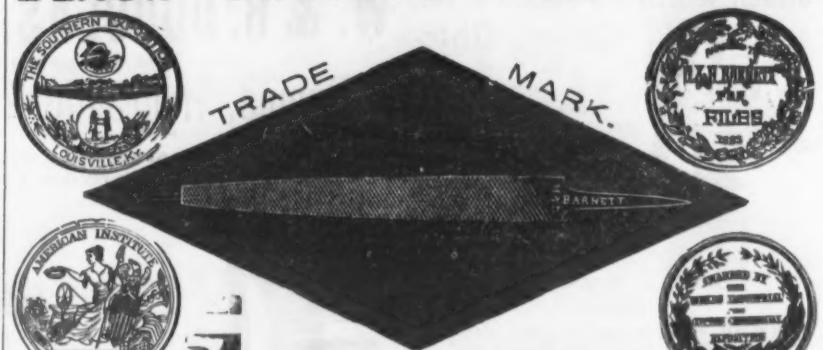
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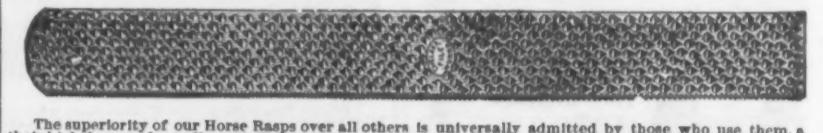


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Specially Adapted for Use on Wire Fence.

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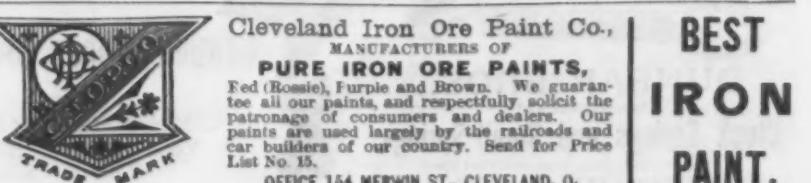
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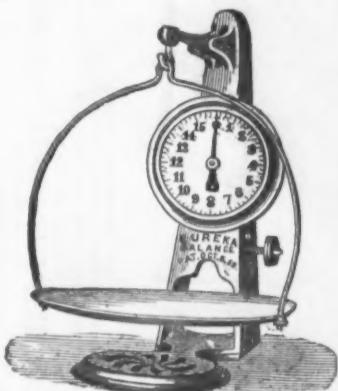
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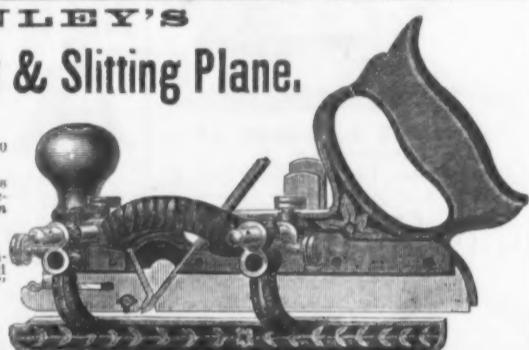
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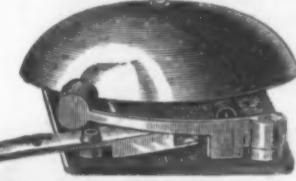
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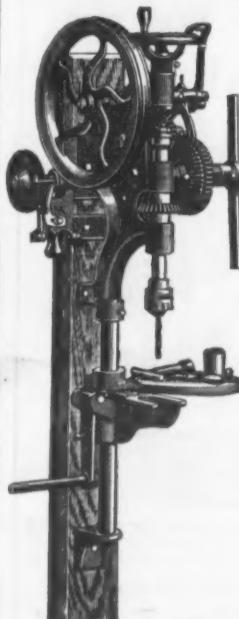
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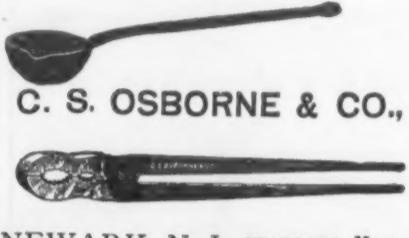
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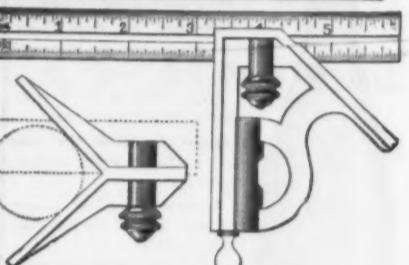
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Send for full list of New Tools.**The Star Scissors and Shears,**

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Send for Prices of

SEYMOUR'S**DIAMOND EDGE SHEEP****SHEARS**WHICH NOW TAKE
THE LEAD.RETAILERS CAN NOW OBTAIN THESE
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These SHEARS are pronounced by thousands of practical Sheep Shearers as being far ahead of any yet manufactured season. The demand for next orders must be sent in at delivery to insure prompt attention.

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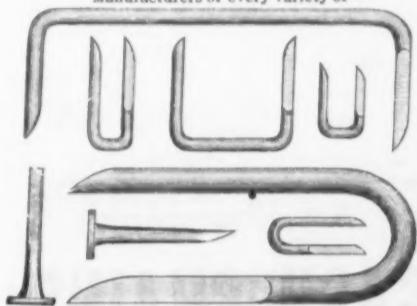


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In addition to Spoons of this well-known brand, we are now prepared to furnish Forks of the same quality. We GUARANTEE these goods to be SOLID and of UNIFORM quality throughout, with no coatings to wear through or flake off, and with no liability to RUST.

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FLORENCE TACK CO.,
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Manufacturers of every variety of

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Our STEEL CLINCH STAPLES will drive in harder wood or mortar than when made from iron. They can also be clinched as well as any soft Iron Staples.

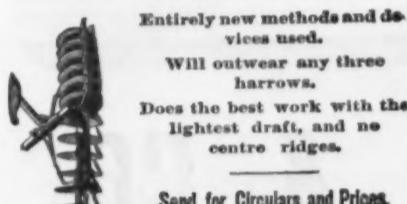
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Does the best work with the lightest draft, and no centre ridges.

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Self-Adjusting Five Roll Roller Bush Blocks

which for strength and durability cannot be equalled by any other make. These Roller Bush Blocks give twice the service of Iron Bush Blocks, and are far more preferable to use on account of greater ease in hoisting. Try them and find out for yourselves. Call for the "Star Brand" SELF-ADJUSTING FIVE ROLL ROLLER BUSH BLOCKS.

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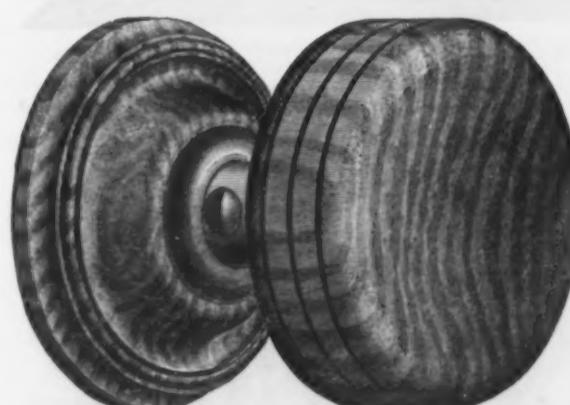
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WOOD DOOR KNOBS.

BARDLEY'S PATENT.



Architects, builders, house owners and the trade require a line of Knobs, Key Plates, &c., which, while reasonable in price, are more attractive than the usual Porcelain or Mineral Knobs and less expensive than Bronze or Brass Knobs.

Our line of Wood Knobs for use on Doors, Closets, Shutters and Drawers, Key Plates, Door Stops and Drawer Pulls, we can confidently recommend as to quality, durability and attractiveness. They are made regularly in Ash, Oak, Apple, Walnut, Mahogany and Cherry, but can be furnished in any style of wood, to match any particular trim, on special order, at slightly increased cost. They are finished in the natural color in a way which experience has proved to be entirely durable, and which is very beautiful.

Every pair of Knobs is positively warranted not to come loose or give out in any way. This line has been in the market several years and has given the best satisfaction to the trade, architects and users. Inferior goods have been put on the market to imitate ours, but they imitate in shape and appearance only, the quality and finish being cheap and poor. None are genuine Bardsley's unless packed in boxes labeled, "The Yale Lock Mfg. Co."

Price Lists furnished on Application.

SOLE AGENTS:

THE YALE & TOWNE MFG. CO.

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NEW YORK: 62 READE STREET.
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depth of 14 inches, and the whole surface bricked as before. This time it lasted for eight years, until last fall, when a small break occurred. Some small quantity of water had washed the earth from between two rocks, in the side of and near the bottom of the end embankment, in the same old way. The weight of the superincumbent water had then sprung back the side planks, and the water had escaped by some underground channel. Being relieved of the weight the planks had sprung back. The fact of the springing back and subsequent release is shown by there being a number of small fish caught and crushed in the cracks. This was repaired, as usual, by filling in with fire-clay, and at that particular place there is now 3 feet of fire-clay rammed in between the rocks, then the planking, then 14 inches more clay and then the brick lining. It is hoped now that it will last.

Ancient Toys.

Puppets, or marionettes, writes the author of the "Romance of Invention," were patronized by both the Greeks and Romans, and automata, which are the inventions with which principally he deals, also go back to a remote period. Vulcan's tripod on wheels has the authority of Homer; Dedalus made moving statues; Archytas, of Tarentum, 400 B. C., invented a wooden pigeon that could fly in the air. In the sixteenth century Regiomontanus made an iron fly that moved through the atmosphere, and afterward an automatic eagle, which, on the arrival of the Emperor Maximilian at Nuernberg, flew forth to meet him. Albertus Magnus is credited with constructing a head that moved and talked, and which so frightened Thomas Aquinas that he smashed it into pieces, Albertus exclaiming when he saw his achievement destroyed, "So perishes the work of 30 years." Roger Bacon made a speaking head of brass, which excited awe among all who heard it. Speaking automata have been frequently attempted of late years, but the great difficulty lies in simulating the human voice. The most successful of these efforts was that of Professor Faber, of Vienna, exhibited in London 40 years ago under the name of Euphonia. Faber worked 25 years at the automaton. The figure enumerated words and also sang. There was an arrangement of hollow pipes, pedals, and keys, which the inventor played to "prompt the discourse."

Willars de Hancort, in the 13th century, constructed an angel that "would always point with his finger to the sun." The Marquis of Worcester made an artificial horse that would carry a rider as swiftly as if he were a genuine bard. Philip Camuz invented a wonderful group of automata for Louis XIV—a coach and four horses, that started off with the crack of a whip, the horses prancing, trotting, and galloping in turn; it ran along until it got in front of the king, when it stopped, when a toy footman descended, and, opening the carriage door, handed out a lady "with born grace." The lady made a courtesy, presented a petition to his majesty, and, re entering her carriage, was driven away. Gen. de Gennes, a Frenchman, who defended the colony of St. Christopher against the English about 1686, amused him self by making an automaton peacock, which walked about in all its pride of extended feathers, and picking up corn from the ground swallowed it.

The king of automata constructors was Jaques Vaucanson, born at Grenoble in 1709. While quite a boy he made several self-moving figures. The bent of his mind was determined by a rather peculiar circumstance. Being left to himself in the house of a friend, to which he went with his mother, he perceived through the crack of a partition an old clock with a slowly swinging pendulum which excited his attention. Next time he visited this house he had a pencil and paper with him, and made a rough sketch of the clock. By earnest study and investigation he succeeded in making a clock of his own out of pieces of wood, and his wooden clock kept time fairly well. Then began his experiments with automata. He made a wooden chapel, with moving figures of priests. He invented a hydraulic machine for the city of Lyons, and later, in the same place, perfected a machine for silk weaving that caused the people to rise against him in arms. His first great achievement in automata was his flute player, which was one of the wonders of his time. He had been ill, and made it during his convalescence. The several parts of it were made by different workmen to prevent its discovery. Only a faithful servant aided him in his secret.

According to D'Alembert, the remarkable figure stood on a pedestal, in which a portion of the mechanism was concealed, and the player not only blew into the instrument, but with its lips increased or diminished the sound, performing the legato and staccato passages with perfection, and fingering with complete accuracy. It was exhibited in Paris in 1738, and made a great sensation. Vaucanson next made a flagolet player, and later a mechanical duck, which waddled, swam, dived and quacked, and, like De Gennes' peacock, picking up and swallowing its food. He was engaged on an endless chain when he died. He willed all his automata to the king.

Maetzel, the inventor of the metronome and of several musical automata, opened an exhibition in Vienna in 1809, with a life-size automaton trumpeter as the chief attraction. When the audience entered all they saw was a tent. After a time the curtains parted, and Maetzel appeared leading forward a trumpeter in the full regiments of an Austrian dragoon. By pressing the left epaulet of the figure he made it play cavalry calls and a march, and an allegro by Weigl, accompanied by a full band of living musicians. Nor was this all. The figure retired and reappeared as a trumpeter of the French Guard. Maetzel wound it up on the left hip, pressed once more on the left epaulet, and it played the French cavalry calls, a French cavalry march, a march by Dusek and one of Pleyel's allegros, the full band again accompanying. Knauss exhibited at Vienna an automaton that wrote, and the Droses, father and son, constructed several mechanical figures that both wrote and played musical instruments. A pantomime in five acts was performed by a troupe of puppets in Paris in 1729, and Blenfalt, in 1746, got up a representation of "The Bombardment of Antwerp," by automata. Another piece performed by Blenfalt's automata, which he called "comediens praticiens," was "The Grand Assault of Berg op Zoom."

A petroleum furnace is being constructed for the Britton Iron and Steel Works, in Cleveland, and the Cleveland Rolling Mill is making experiments in the same direction. An official in the Standard Oil Company's works, in that city, is reported as saying that oil will soon supersede all other fuel in heating boilers and stills in their establishment.

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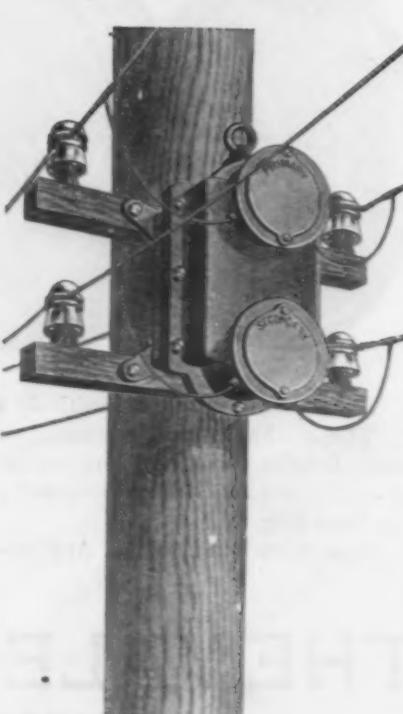
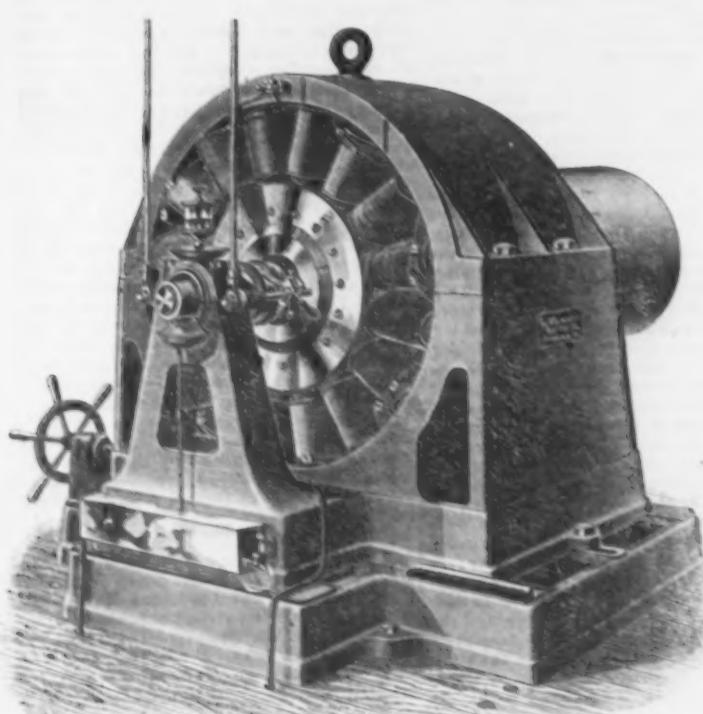
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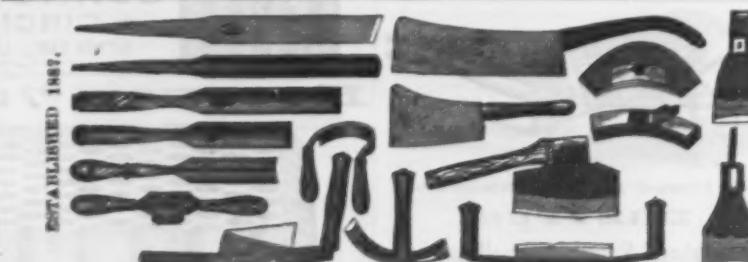
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FRAUDULENT PURCHASE.

D. sold to E. a lot of lumber for \$2500 about June 5, 1884, and E. made a general assignment on July 17, 1884. D. brought an action of replevin to recover the lumber on the ground that E. must have been informed of his insolvency when he made the purchase. It appeared that E. did not keep proper accounts, only having a book of sales made; that he owed \$20,000, of which \$10,000 were secured by mortgage on his stock of lumber; that he had \$1200 due him for book debts and the stock which was mortgaged; that he had been embarrassed by some land he was carrying and which he had just got rid of by making some sacrifices, and that he was unexpectedly compelled to make the assignment because he had been refused a loan which had been promised to him. In this case—*Dalton vs Thurston, assignee*—the Supreme Court of Rhode Island decided in favor of the assignee. The chief justice, Durfee, in the opinion, said: "The mere fact that a purchaser is insolvent does not make his purchases invalid. Though deeply insolvent there is no presumed fraud. This is not a question of reasonable expectation, but of fraudulent purpose. It is not a question whether the grounds of belief of the purchaser that he could go on in business was sound and rational, but whether he did so believe in point of fact. We find nothing to show in this case but that the purchase was made to carry on the business as usual."

PARTNERSHIP.

T. gave his note to S. & Co., and they had it discounted. The day it was due S. & Co. telephoned to the bank which held it: "If T. will not meet his note to-day, he can telegraph on me for the amount. L. S." And later, the same day, L. S. (he was one of the firm of S. & Co.) again telephoned to the bank: "Have learned that T. is away from home. If he has not left draft with you, you will please pay note and save protest. You can draw on me. L. S." At the time L. S. sent these dispatches the firm of S. & Co. had been dissolved. The bank drew on S. & Co., but the draft was returned unpaid. It then drew on L. S. personally, which was done, but that draft, too, was returned unpaid. The bank then brought suit on the note and recovered judgment. The case on appeal—*Seldner vs. Mount Jackson National Bank*—was also decided by the Court of Appeals of Maryland against S. & Co. Judge Robinson, in the opinion, said: "1. The date of the dissolution of the firm of S. & Co. seems to be in doubt, but the date, we think, is immaterial. L. S. had the right to waive protest of T.'s note as long as the partnership lasted, and we can see no reason why the mere dissolution of the partnership should operate to revoke his authority. It operated, no doubt, as a revocation of all authority on his part to bind his former partners by a new contract, but it did not revoke his authority to adjust, liquidate and settle the partnership affairs. The note was in the hands of the bank, and S. & Co. knew they could be bound by notice of protest after demand made upon the maker, and L. S., when he learned that T. would not pay the note, he could waive demand and notice, and save the note from dishonor. By doing this he makes no new contract, but merely dispenses with a requirement of the law intended solely for the benefit and protection of the endorser. 2. It is further contended by the appellants that if L. S. had authority to waive the protest after the dissolution of the firm, that he did not, in fact, waive it; that his telegram would not bear that construction. It is not necessary that the waiver be expressed in so many words. It matters not what particular language is used, provided it plainly appears that the endorser meant to dispense with the demand and notice. It has been held in many cases that any language calculated to induce the holder not to make demand or protest is sufficient."

FORGERY.—PURPORTED SIGNATURE.

R. sued his bank for a balance claimed by him, he having disputed the genuineness of his signature to a check charged against his account. In this case—*Rose vs. First National Bank of Springfield*—the cashier testified that the check had been signed by R., and on cross examination he was shown several checks signed with R.'s name, which he said were genuine. They were not, and R. had judgment. The bank appealed to the Supreme Court of Missouri and succeeded. Judge Black, in the opinion, said: "Papers not in the case cannot be referred to establish or defeat by comparison a disputed signature."

TRADE-MARK.

H. and P. were partners, and they made and sold two soaps which bore H.'s name as a trade-mark. Because of H.'s violation of the partnership agreement a dissolution of the firm was agreed to, H. selling out to P. When the firm was formed H. brought into it, by the agreement, the good-will of the business he was then conducting in making and selling these soaps; his tools, implements and fixtures, and throughout the business the trade-marks in question were used. P. associated C. with him, under the firm name of C. & P., and they made and sold these two soaps, using H.'s name on them as a trade mark. H., shortly afterward, began making the soaps again, and gave out that he was the successor of the old business of H. & P. H. then sued C. & P. to restrain them from using his name on the soaps as a trade mark, and they, C. & P., sued to enjoin him from representing that he was continuing the business of H. & P. In these cases—*Hoxie vs. Charvey*, and *Charvey vs. Hoxie*—H. was defeated, and he appealed to the Supreme Judicial Court of Massachusetts, where he was again beaten. Judge Charles Allen, in the opinion, said: "1. A court of equity will not lend its aid to protect a person in the use of a trade-mark bearing the personal name of another, which he claims has passed to him upon the sale of a business, if the use of the name carries with it any representation that the personal skill and labor of that person was employed upon the making of the article labeled. But if it appears, as in

this case, that the formula of the person named only was used, and that the soaps were made according to this formula was intended to be conveyed by the use of H.'s name, then the use of the name cannot be enjoined. 2. The bill of sale to P. was made without any agreement that it was to be taken back into the firm. Its terms were broad, and although the trade marks and good-will of the firm were not expressly mentioned, both are included within its meaning. 3. As there was no stipulation in the bill of sale that H. should not carry on a similar business, he may engage in the like business, but he cannot represent himself to be the successor of the business which he has sold to another."

ARBITRATION.

C. and B. were partners and they differed about their accounts after they had dissolved. They agreed to arbitrate the matter in dispute, and the arbitrators made an award to which B refused to accede. C. sued on the award, and B. set up in defense, that as neither the arbitrators nor the witnesses were sworn the award was not binding on him. He was defeated, and carried the case—*Cochran vs. Bartle*—to the Supreme Court of Missouri, where the judgment was affirmed. The chief justice, Norton, in the opinion, said: "The award is valid though the arbitrators and the witnesses were not sworn, notwithstanding the statute requires the arbitrators to be sworn. The parties may waive the taking of the oaths in both cases. In this case the oaths were waived, for one of the arbitrators stated at the first hearing that the arbitrators had not been sworn, neither had the witnesses, and therefore he supposed that all formalities were waived. This was disputed on the trial, but the jury found in favor of the plaintiff, and that binds us. The judgment must stand against the defendant."

NEW PUBLICATIONS.

SCREW THREADS. By Paul N. Hasluck. Size, $\frac{3}{16}$ x $\frac{3}{16}$ inches, 79 pages. Published by Crosby, Lockwood & Co. Price, 40 cents.

Of the large number of popular little handbooks of workshop manipulations which have been published within the past few years, Mr. Hasluck has contributed a no mean proportion, his latest work being a vast pocket edition of a book on screw threads, screw cutting, &c. A condensed exposition of the subject, such as he has given, will, no doubt, be received favorably, and those who will examine it with a view of getting information which may be readily applied in practice will not be disappointed. There are five chapters devoted respectively to sewer threads, dies and die stocks, screw cutting on lathes, cutting complex thread rates on self-acting lathes, and tap making. The screw-cutting lathe, its principles and action, are discussed, and the several forms of standard screw threads are illustrated. The subject throughout is treated in a very simple manner, without the usual, though unnecessary, complications.

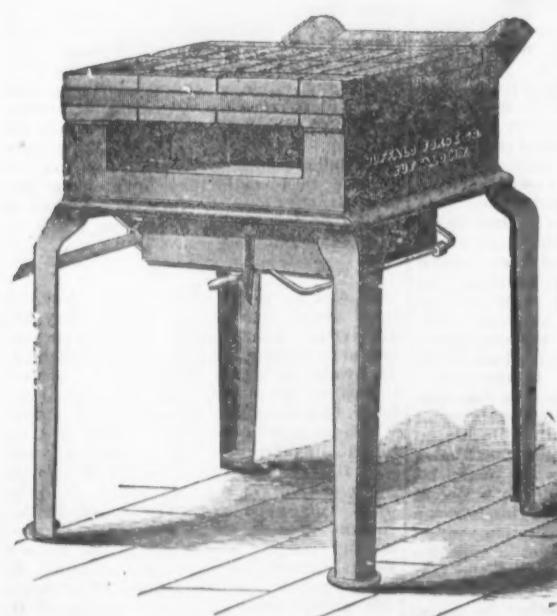
MANUAL OF SCREW CUTTING. By William Stimpson. Size, $\frac{3}{16}$ x $\frac{3}{16}$ inches, 31 pages. Published by W. Woodberry & Co. Price, 30 cents.

The fourth edition of this little book, which has just been issued, would seem to testify to its popularity. It embraces short chapters on the lathe, the screw and its use, and on the driving screw, and gives a series of rules have also been added in this edition for determining the speeds and diameters of pulleys, and length of belting. The concluding pages are given up to tables of the United States and the Whitworth standard threads for screws and gas pipes, the United States' standard for bolt-heads and nuts, figures for the safe working strain of bolts, and examples illustrating the various rules presented.

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	Killed.	Injured.
	Per cent.	Percent.
Coupling or uncoupling cars.	13.1	46.8
From accidents.	15.7	11.1
Falling from trains or engines.	27.4	18.5
Various causes.	38.6	

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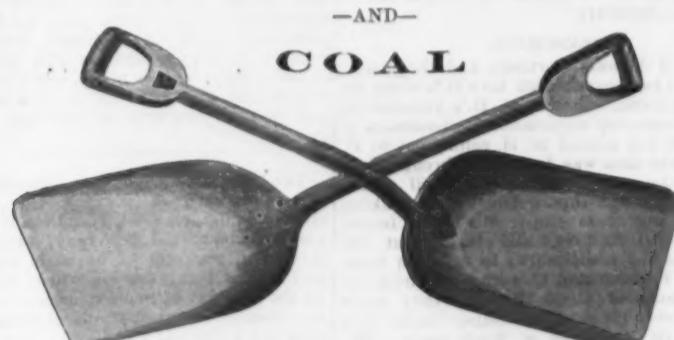
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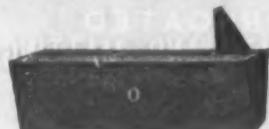
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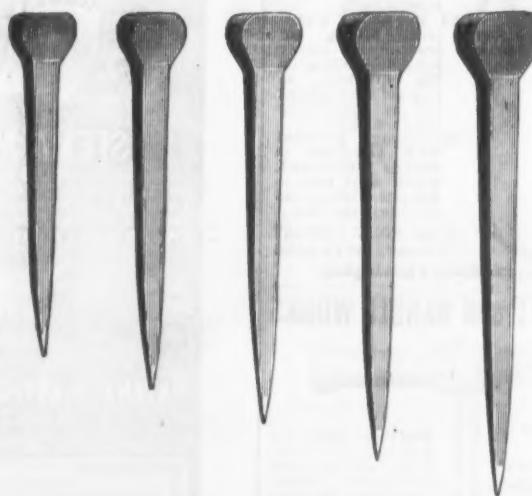
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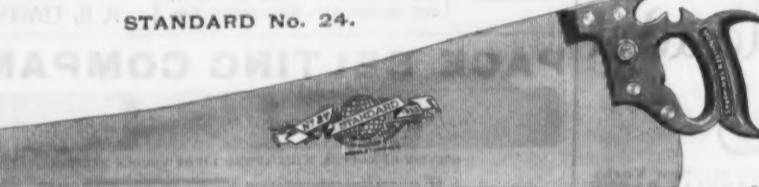


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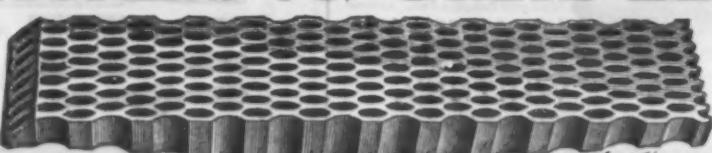
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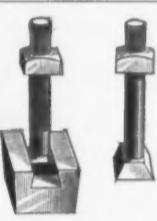
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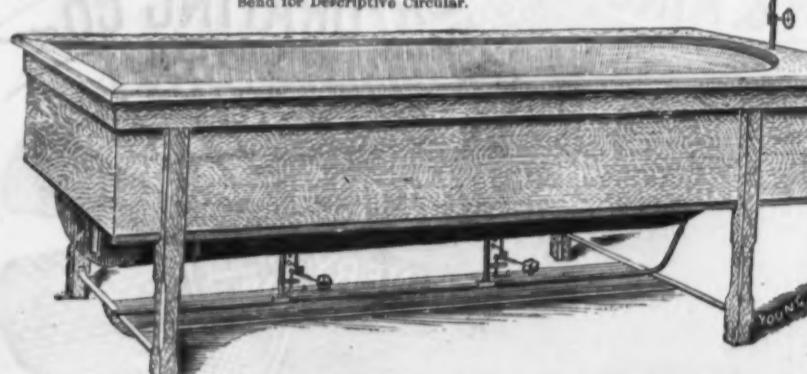
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Forged from a single piece of Cast Steel, without welding. The best, strongest and hand somest ever made. For sale by

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English Letter.

(From Our Regular Correspondent.)

LONDON, June 20, 1887.

THE JUBILEE

is upon us at last in all its intensity, and it is quite patent that the whole of this week will be given up to "jubilation" in one form or another. The official celebration does not commence until to-morrow, but to day the city proper is almost impassable, and it is estimated that by to-morrow evening the ordinary population of about 5,500,000 will be augmented by another million. As the whole affair will have been described by cable in your daily papers long before this letter reaches you, I shall only remark in this connection that the Jubilee preparations and doings have at last given a tremendous fillip to many branches of trade. For gas piping and tubes, burners, wire and fancy devices, crystal shields, banners and the like, the demand has utterly paralyzed the sources of supply, and the producers have simply collapsed under the call which has been made upon their resources. Workmen have been "at it" night and day, and have not overtaken their tasks. For knives, forks, tableware, &c., &c., a similar demand has existed, which is not to be wondered at, seeing that pretty nearly the whole of the lower classes throughout the country will be feasted gratuitously to-morrow. Certainly no such event has ever before been so generally observed in this or any other country. The decorations and illuminations surpass everything the world has ever seen, and the throng of visitors, from kings and princes downward, is literally astonishing. Among others it is estimated that we have nearly 150,000 Americans in London at the present time, most of them trying hard, and successfully, to get a fair amount of enjoyment out of the festivities of this effete old monarchy. Among others, Mr. Andrew Carnegie is giving almost regal hospitality at the Hotel Metropole, where he has engaged one of the best suites of rooms, and will to-morrow entertain a host of his American and English or Scotch friends. Mr. Carnegie is reported to have enjoyed his wedding trip hugely. As to business proper, I fear there is little to be said. I met a man this morning who had made five calls and found nobody in, so that, as I have said already, the week is to be given up to holidaying.

The iron markets have been steadied by the continuance of the remarkably fine and blazing hot weather, which tends to a lessening of the production at the iron and steel works, while also raising the hopes of the farmers and others, to whom the weather is always a serious consideration. It is anticipated that such weather with you will also lead to many of the mills and forges being laid off, and so send some orders to this side. Already, as I cabled to you on June 15, orders for some 10,000 tons of Scotch pig have been received at Glasgow. One order was for 3000 tons and another for 2000 tons, the balance being made up of smaller lots. All were for No. 1 iron of special brands. These orders are attributed to the coke strike, but it is not certain that such is the case. It is hoped that it is not, in which case there will be the chance of further orders coming over. The collapse of the wheat corner is welcomed by exporters, as its break-up will give them a larger supply of outward vessels at lower freight rates, and so enable them to make c.i.f. prices at United States ports much lower than they have been of late. I am unable to trace any large American orders for hematite or Cleveland pig, but there are numerous inquiries here for blooms, billets, scrap iron and old rails, and in these old materials negotiations are likely to lead to the placing of orders of some importance.

THE IRON MARKET

has maintained its encouraging features, and in some respects these have become more marked. The Glasgow warrant has been upward in tendency, closing 42/2, chiefly owing to some good sales on United States account of No. 1 special brands. Makers' brands, however, have profited by them, and, coupled with the reduction of the temporary number of furnaces in blast, makers hope that the improvement will be carried further. In Cleveland an advance is chronicled, buyers being more willing to pay 6d. better than they offered a fortnight ago. Makers, however, have cared little about selling under 35/- for prompt delivery, and only a few parcels have changed hands. In this market the encouraging conditions are freely admitted, and hopes, on the whole, are higher than they have been for many months. On the West Coast makers remain well employed upon orders for shipment booked several months ago, and it is reported that further orders have just been given out for a large quantity of hematite pigs for the United States. Meantime mixed numbers are nominally quoted about the same as before. In Staffordshire there is little or no change, the slight movement elsewhere observable not having manifested itself in this district. Business done has theretore been of a comparatively unimportant character. Sheets, especially black ones, are stiffer, owing to the necessity to lay off some of the mills on account of the hot weather, and greater firmness has ruled in galvanized sheets. Prices, however, have not advanced. In most other finished branches a little better condition is reported. Buyers are showing greater willingness to do business, especially in bars and rods. Angles and tees have also attracted rather more attention, while in heavy work and bridge building materials not only have some good orders been placed recently, but further specifications have been issued by the India Office and some of the Indian railway companies. Old rails are scarce, and buyers from the United States have shown a desire to close within certain limits, but their offers have not been sufficiently tempting, and, as holders are determined to stand out for their own terms only, little business has been done. F. Pitts & Co., London, quote old D. H. rails, 55/-; heavy wrought scrap iron, 47/6 @ 50/-; iron fish plates, 62/6 @ 65/-, and leaf spring steel, 52/6 @ 55/- all f.o.b. London or other good port. Scrap is very scarce. Freights remain firm, with a tendency toward an advance for nearly all ports.

Steel is much in demand, and almost without exception the works are well employed. Business in bloom has been done at about 75/- f.o.b., fully 2/6 advance upon what buyers offered last week. Siemens-Martin billets are quoted f.o.b. Glasgow 92/6, and basic billets at the same port, 72/6 $\frac{1}{2}$ ton f.o.b. Steel rails have been in request this week for the United States, and rumors concerning the sale of several thousand tons have been in circulation. The 5000 tons of 36 lb section required by the Chinese Government for the construction of the Formosa Railway, have been placed with the West Cumberland Iron and Steel Company (Limited), at a price (including the fish plates, &c.), of about £4. 8/- $\frac{1}{2}$ ton, leaving for the rails between £4. 2/- and £4. 2/6 $\frac{1}{2}$ ton. Since that transaction was concluded, other rails of about the same section have been sold in South Wales at about (for rails only)—no fish plates, &c.) £4. 5/- $\frac{1}{2}$ ton, f.o.b. Newport.

SCOTCH PIG IRON

is steady at the moment under the circumstances just described, and there is a very hopeful tone in the market. There are 80 furnaces at work, as against 85 a year ago, two having been relighted last week. In Connal's stores there are 885,151 tons (an addition last week of 3000 tons) as compared with 776,214 tons a year ago, or an average increase of 3000 tons a week. Warrants are 42/5 @ 38/4 this date in 1886. Shipments to date are 4533 tons behind hand, while the importations of Middlesboro' pig into Scotland are 13,025 tons ahead this year.

MIDDLESBORO' PIG IRON

is steady, and inclined to greater firmness at the rates currently cabled to you. The smelters are trying to weed out the bears by refusing to sell forward, and are meeting with some success.

HEMATITE PIG IRON

is also steady at the following rates for West Coast makers' brands.

No. 1, No. 2, No. 3.
Cleator..... 40/6
Lonsdale..... 44/6 44/
Workington..... 44/6 44/
Lowther..... 44/6 44/
Distington..... 44/6 44/
Solway..... 44/6 44/
Marlport..... 44/6 44/
Harrington..... 40/6 45/

There are 54 furnaces at work, as compared with 41 a year ago. Stocks in stores only are 216,162 tons—an increase of 85,132 tons since Christmas last. Pig iron shipments are 10,129 tons ahead, and rail shipments, 85,132 tons ahead.

TIN PLATES

In London the market is stronger and with a good business doing at the time of writing, it is not easy to place orders below 13/- f.o.b. Liverpool for ordinary brands of IC cokes. At Liverpool firmness of tone and steadiness of prices still characterize most of the movements in the tin-plate market. Terne plates and certain sizes of tin plates—such as 14 x 19 $\frac{1}{4}$ and 19 $\frac{1}{4}$ are scarce. The majority of the works seem to be pretty full of orders. Terne plates continue to be much sought after for forward delivery, and so also are 14 x 20 coke-tins and Bessemer steel cokes and 10 x 20 Siemens steel plates. There are numerous inquiries for special sizes in Siemens steel plates with coke finish and in assorted specifications. Quite a new feature in the tin-plate business is the large number of light weight plates that are required for the States now. These are being asked for chiefly in 14 x 20 size. There is a good demand for coke tin and Bessemer steel coke-wasters. In charcoal tin plates very few specifications have been received. Coke tin plates are quoted 13/- @ 13/6 IC; Bessemer steel cokes, 13/3 @ 14/- IC; Siemens steel cokes, 13/9 @ 14/3 IC; coke tin wasters 12/3 @ 12/6, and Bessemer steel coke wasters 12/7/8 @ 12/9, all f.o.b. Liverpool. Terne are 24/6 up to 27/6. Welsh shipping ports; wasters 22/6 @ 23/6. The price of 19 $\frac{1}{4}$ x 14 tin plates, is as a rule 13/-, though some parcels of certain brands were sold at 12/10 $\frac{1}{2}$, and 10 x 20's are firm at 10/-, Wales.

THE HARDWARE TRADES

In London the outlook is undoubtedly far and away better than has been experienced for some time. Not only are there less complaints than usual, but there is a degree of briskness in various branches of trade which is most encouraging. Those who hold large stocks of ware for illuminating purposes were a month ago agitated by many doubts; now affairs have taken such a turn that the demand cannot be met, and holders have done many a good stroke of business. In the decorative and gas fitting departments, the requirements of the hour exceed all ordinary means of supply, overtime on a large scale being invoked to grapple with the difficulty of the situation, and even then some of the houses which make a specialty of that class of work have been obliged to refuse orders. Cheap knives, forks and spoons have had quite a run, the festivities of the coming week creating a demand, of which traders have not been slow in taking advantage. At Birmingham production is rather active just now in the local hardware branches, as a consequence not so much of any marked improvement of demand as of the frequent interruptions caused by holidays, and the necessity, therefore, of making the most of an unbroken week. The jubilee has rather disappointed expectations as regards general goods, but medals and badges can hardly be turned out fast enough to meet the demands, and the makers of gas tubes and fittings and glass lamps are also benefiting to some extent by illumination orders. The Germans, however, seem to be getting the lion's share of the glass lamp trade, in virtue of their low quotations. At Sheffield no change is to be noted in the general condition of trade in the district. The improvement in the file trade noticed last week continues, and, besides the heavy branches, the other trades that are doing better are spades, shovels, and mining tools, saws, and edge tools (with exceptions). The cutlery and plating trades are, however, in a languid condition. There continues to be demand for steel, and although prices are not any better, there are indications of an encouraging character. I understand that some Government contracts have recently been placed.

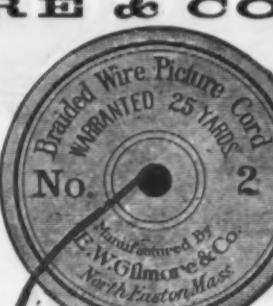
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Tinned, Gilt and Gold, put up in small round boxes of 25 yds. and 25 feet, warranted full length; cord pulled out through hole in center of box.

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Calibres 32 and 44

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Superiority in Every Point Universally Conceded.

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3D FINE NAILS, STEEL OR IRON,

SMALL NAILS, ALL STYLES,

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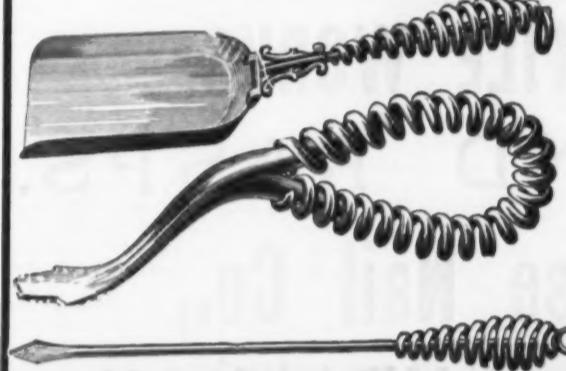
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SILVER, GOLD, NICKEL, BRASS
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Also Small Castings to order in
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Estimates given on receipt of samples and state-
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Iron and Steel made nearly Impenetrable.

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We are introducing the Adamant Powder in this
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easily applied and produces a nearly impenetrable
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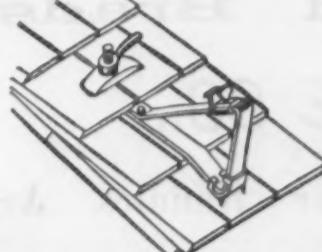
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Endorsed by all who have occasion to go upon roofs.
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cannot slip or tear the shingle. Address
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Of all Sizes to any Length.
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Delivered.

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Also various styles of Two-seated Carriages and Wagons.

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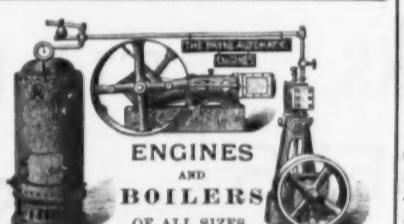


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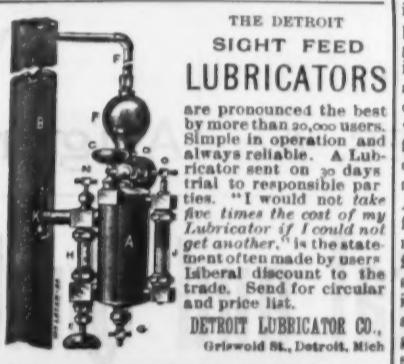
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Our patented Vertical Boiler will not prime. No
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The apparatus is reliable and
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ARE BEST FOR ALL PURPOSES.

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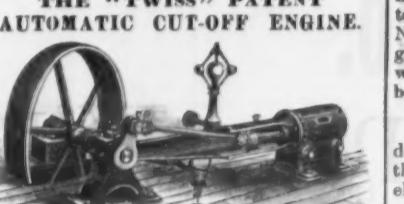
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MIN. AMT. FOR OTHER TOOLS.

SEE ALSO PAGE 100.

Meeting of Makers of Chilled Cast-Iron Wheels.

On January 27, 1887, a meeting of chilled cast-iron wheel makers was held at the Gilsey House, New York, for the purpose of endeavoring to effect uniformity of methods of dealing with railway companies. There was considerable discussion, and the meeting finally appointed a committee on permanent organization, with instruction to report at a meeting to be held at Minneapolis at the time of the meeting of the Master Car Builders' Association. The meeting convened at Hotel West, Thursday morning, June 16. Mr. W. W. Snow was in the chair, and Mr. W. K. Chapin and John R. Whitney, chairman, reported a series of resolutions, in which they recommended that no permanent organization be formed, but that there be an agreement to meet annually. It was decided, however, to form a permanent organization, and a committee to present a plan and draft a constitution was appointed, consisting of Messrs. Snow, Chapin, Whitney, White and Heckler, with instructions to report to a meeting to be held at 3 o'clock p.m.

At the afternoon meeting a constitution was adopted, which is to be printed and sent to all car-wheel makers. Meetings are to be held at the call of the Board of Managers. The following officers were elected: Hon. W. H. Barnum, president; J. H. Barr, vice-president; W. W. Lobdell, secretary; N. P. Bowler, treasurer. Board of Managers, John R. Whitney, Frank J. Heckler, W. W. Snow, N. S. Bouton, E. B. Tippett. Papers by W. H. Barnum, John R. Whitney and E. B. Tippett were referred and read to the Board of Managers. A committee which had invited the Master Car Builders' Association to appoint a committee of conference was continued, with instructions to wait on the Master Mechanics' Association and request the appointment of a similar committee. The association then adjourned, subject to the call of the Board of Managers.

The following manufacturers were present at the meeting: Ramapo Wheel and Foundry Works, Ramapo, N. Y.; Rochester Car Wheel Works, Rochester, N. Y.; Terre Haute Car Works, Terre Haute, Ind.; Missouri Car and Foundry Company, St. Louis, Mo.; Geo. H. Thacher and Co., Albany, N. Y.; Cayuta Car Wheel Works, Sayre, Pa.; Bass Foundry and Machine Works, Fort Wayne, Ind.; J. H. Bass, Chicago, Ill.; St. Louis Car Wheel Company, St. Louis, Mo.; Griffin Wheel and Foundry Company, Chicago, Ill.; Ohio Falls Car Works, Jeffersonville, Ind.; Lobdell Car Wheel Company, Wilmington, Del.; Barnum Richardson Company, Lime Rock, Conn.; Peninsular Car Works, Detroit, Mich.; Menzel & Ferguson, Minneapolis, Minn.; Barnum & Richardson Mfg. Company, Chicago, Ill.; Ensign Mfg. Company, Huntington, W. Va.; Washburn, Hunts & Co., Jersey City, N. J.; C. A. Treat Mfg. Company, Hannibal, Mo.

Experimental Cast-Steel Guns.—During the last session of Congress, an appropriation of \$20,400 was made and authority given the Secretary of the Navy to expend it in purchasing three steel cast, rough bored and turned, 6 inch, high power rifle cannon of domestic manufacture. This proposal was issued on the 29th ult. The law specifies that one shall be of Bessemer steel, one of open hearth steel and one of crucible steel. The proposals will be opened on August 2. Proposals may be made either to furnish three completely finished cannon, made from unforged castings, or three unforged, rough bored and turned castings for such cannon, of the same material respectively, to be finished by the department in accordance with the bidders' design. Each gun, when completed, must be capable of safely discharging projectiles weighing 100 pounds each, with a muzzle velocity of not less than 2000 feet per second. No gun or casting for a gun will be paid for until the gun shall have been completed and have successfully stood the statutory test required by the act of July 26, 1886. No proposal will be considered unless accompanied by satisfactory evidence that the bidder controls a plant adequate to the production of the gun or guns, casting or castings which he proposes to furnish. The proposal, so far as the navy is concerned, is a novel one. The army has a cast-iron gun at Sandy Hook of the largest caliber, which has been fired many times and has been favorably reported upon. The test now proposed for the navy will give the advocates of cast-steel guns the fullest opportunity to demonstrate what they so persistently urged upon the Appropriation and Naval Committees of both houses of Congress. Officers of the navy, too, are interested in the result, since the Navy Department is now building up a great gun plant at the Washington Navy Yard, where the guns advertised for may have to be completed.

A Simple Form of Electric Pen.—A description has been given by Dr. J. Carel in the *Electrician* of a simple way to make an electric pen for multiple copying of letters or drawings. A tracing of the drawing to be copied is taken on thin paper, which is then

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SPECIAL ATTENTION GIVEN TO THE EXPORT TRADE.

MECHANICAL.

Improved Level.

We show on this page an 18-inch improved wye level, just being put upon the market by William Gardam & Son, 96 John street, New York. The device has several features of improvement about it that render it of interest to architects, engineers, and all who have to do with leveling operations, whether about buildings or in running lines in connection with engineering work. The special feature of the device is the provision that is made for quick leveling and setting up on a very rough and uneven ground. The design of the upper part is similar to the regular wye level and contains the improvement which the firm above-named have put into the usual form of this article—viz., the clamp and tangent revolving with the telescope, long center telescope, and spirit level as close to the center as possible, improved clips to the wyes, &c. The design of the lower part of the present device, is new, and contains improvements recently patented. Our engraving shows in detail the construction, operation, and manner of detaching the upper part of the instrument from the parallel plates, and also shows distinctly the form of socket and the manner in which it is attached to the parallel plates. The clamping ring and spring catch are also indicated. In using the instrument, the operator proceeds as follows: After screwing the parallel plates to the tripod head, the socket B is inserted in the cavity provided for it, and is then turned to the left until the spring catch A drops over the edge of one of the flanges on the socket B. This is simply to prevent it being turned backward. The ring A is then screwed down, which causes it to grip the socket B firmly,

which holds the instrument perfectly rigid and completes the preparation for use. By slightly unscrewing the ring A the instrument can be moved to any angular position at will. The amount of friction and bearing surface is so great that it is claimed there is not the slightest chance of the instrument shifting when being used. The simplicity of the device, the makers inform us, is so great that they guarantee that it cannot get out of order with ordinary care and use. The weight of the instrument is 12 pounds, and the tripod 7 pounds. The telescope is 18 inches long, and the object glass 1½ inches in diameter and of the highest magnifying power obtainable.

Application of the Abt Rack-Hall System.

It is stated that the Abt rack rail system is to be tried on the English military railroad through Bolan Pass, on the Afghan frontier of India. Materials for 10 miles of road have been sent out, with two locomotives, and the road will be laid this year. The success of the Abt system on the Harz Railroad has attracted much attention, and this Indian case is only one of several proposed applications of the system.

Self-Adjusting Crank Boxes and Connecting Rods.

Mr. T. W. Broomell, of Christiansburg, Pa., is putting on the market an ingenious self-adjusting device for crank boxes and connecting rods. The cut which we present shows the arrangement so plainly that an elaborate description is unnecessary. It will be noticed that a combination of wedges is employed. The boxes are fitted in the usual way, except that the one on which the wedge acts has a free fit. In cutting the opening in the rod, one end is cut on an angle of any degree that may be required; it is also slotted back to receive a small wedge, actuated by a steel spring, as shown. This spring is inserted through a hole in the rod, its outer end resting against the head of an adjusting screw. After the boxes and wedges are put in place, the spring is put in and compressed by the nuts on the adjusting screw, until the engine runs without thump when fully loaded. As wear takes place the large wedges would become loose, but, instead, the small wedge at the right is moved forward by the spring, thereby forcing the large wedge up and carrying the box forward against the wrist-pin. After the small wedge has moved forward its full length, and



SELF-ADJUSTING DEVICE FOR CRANK BOXES AND CONNECTING RODS.

Made by T. W. Broomell, Christiansburg, Pa.

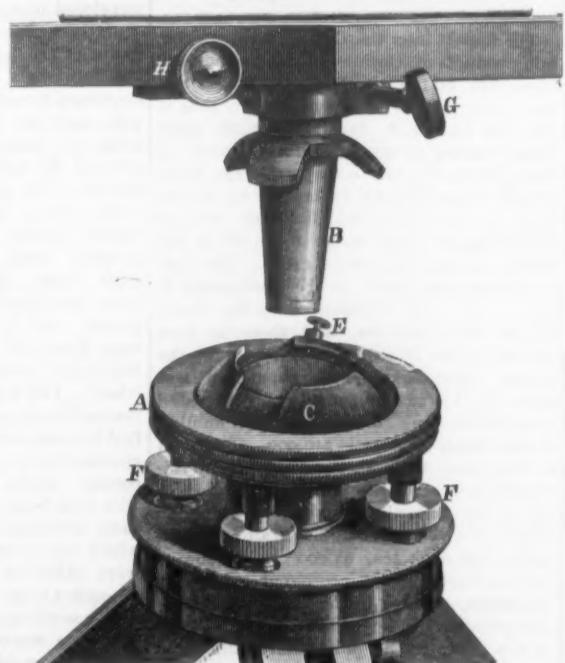
the openings between the boxes are closed by wear, they are planed off, filed in the usual way, and a liner put in.

The device, we are told, works perfectly, being now fitted to several engines, one of them a 12 x 18 inch engine in a rolling mill. When the wedges are properly proportioned it requires only a very light spring to hold them in place.

Steam Packing.

In a long and interesting report on steam packing in locomotives submitted at the last meeting of the American Railway Master Mechanics' Association, we find these replies to one of the questions which had been prepared and sent out by the committee—viz.,

"What is your observation as to the wear of cylinders with cast-iron rings as compared with the old style of brass packing?" Mr. J. Davis Barnett says: "Steam packing did badly bell-mouth the cylinders at each end, and cast-iron rings sprung into place have the same tendency, but in a very mild form, so that this defect is the slightest disadvantage yet experienced with any known style of piston packing. Cylinders will run from 150,000 to 200,000 miles without reboring, but I would recommend a very light cut to be taken at every 100,000 miles, as this practice, while reducing the cylinder friction, will not reduce the thickness of the cylinder shell as much as a heavier cut taken at dates further apart." Mr. J. N. Lauder says: "My observation is that when steam is let under the rings the wear of the cylinder is much greater at the ends than at the center,



IMPROVED WYE LEVEL, MADE BY WILLIAM GARDAM & SON, NEW YORK.

and I try to exclude the steam as much as possible, but steam will go in at the cut to some extent." Mr. Thomas B. Twoombly states: "Cylinders wear out much faster with the old brass packing than with the steam packing. In using steam packing we notice that the cylinders are worn away a great deal more rapidly near the ends, but the packing seems to remain tight, and I do not regard this irregularity as a serious disadvantage. I do not think it necessary to rebore cylinders at any regular periods, but when an engine is in for repairs her cylinders should be inspected, and if worn so much that they are no longer capable of rendering good service they should be rebored. We have many cylinders 10 years old which have not yet been rebored. Mr. G. H. Prescott says that with steam packing cylinders wear most at each end and at the bottom. Mr. H. Schlacks reports that in his observations steam packing wears the cylinders more at the ends than in the center, but while he considers this irregularity a disadvantage, experiments have demonstrated that the packing remains tight throughout the entire travel of the piston. Boring depends upon the quality of the metal in the cylinder. Cylinders usually run about 175,000 miles before reboring is found to be necessary. Mr. John Player says: "With our packing the cylinders wear good, and show as even wear from end to end of piston travel. Cylinders need reboring about once in six or seven years, or say after running about 250,000 miles." Mr. A. Griggs states: "I find the spring ring packing to be of great advantage over the old style of brass spring packing—first, because it costs but one-fourth as much; second, because it is automatic, requiring no springs to set it out; third, because it does not require looking at an average once a year; fourth, when properly fitted up it will run on an average five or six years without renewing, and wear the cylinders comparatively true, showing in that time a difference of not more than 1-16 in. in diameter at the ends and center. Cylinders made of good hard iron will run 10 years without reboring, being counterbored once during that time." C. C. Hobart states: "The wear with us is very even, a trifle more, perhaps, at the ends than at the center of the cylinder, due more to pressure of steam than other cause." Mr. E. L. Weingerber says: "There is less wear with the steam than with the spring packing, from the fact that cylinders are not so liable to get out, as the rings are free in the cylin-

ders when steam is shut off. We find that cylinders are worn more at the ends, but do not consider this any disadvantage, for the reason that the rings are flexible and adjust themselves to irregularities of the cylinders. Cylinders in which steam packing is used require reboring about every four years." Mr. James Mehan says: "I think better results are obtained from the present style of steam packing. I have not noticed the cylinders wearing any more rapidly than with other packing. Boring depends upon the quality of the metal in the cylinder." Mr. John S. Cook says: "With the cast-iron packing we use, we find that our cylinders wear less than with the old style brass-ring packing." Mr. W. H.

Thomas reports: "Where steam packing is used the cylinders wear largest at the ends, more so than by the use of the old-style brass pack with springs. I do not consider this irregularity in the diameter any disadvantage in a packing which is flexible and automatic in its adjustment. Reboring is necessary about once in five years." Mr. G. W. Ettinger says: "Steam packing wears the cylinders less, but not so regularly, as the old-style brass packing." Mr. W. C. Ennis says: "Cylinders wear faster at the ends than with spring packing, but I think with us very little, as we do not rebore cylinders oftener than once in three years on an average, and our mileage on a heavily graded road averages 2650 miles per month per engine." Mr. John W. McGraw says: "Cylinders are worn more at the ends, but I do not regard this as a disadvantage with proper lubrication. We rebore about every 100,000 miles." Mr. John McGraw says: "This style of packing wears a cylinder out faster than the old style spring packing or Dunbar, but is much cheaper in first cost and maintenance." Mr. W. H. Stearns says: "Wears most at ends, but gives very little trouble. Cylinders run from eight to ten years." The grade of iron preferred for use in packing rings is very similar in all reports, a preference for a tough, elastic and not too hard metal being expressed; some think the ring should be softer than the cylinder, so that the greatest wear will be upon the ring rather than the cylinder.

The Mossberg Twist Drill Grinder.

Twist drill grinders and grinding attachments are devices of special interest to tool users, and new and improved designs of such machinery are always worthy of attention. We take pleasure, therefore, in showing on this page engravings representing a new apparatus of this kind, put on the market by Mr. Frank Mossberg, of Pawtucket, R. I. The grinder is simple and effective, and is adapted for grinding to a proper angle and suitable clearance any twist drill or straight groove drill, from $\frac{1}{8}$ inch to $1\frac{1}{2}$ inch diameter inclusive. The main portion of the machine shown in Fig. 1 consists simply of an emery wheel stand of ordinary design, fitted with suitable lugs, to which the grinding attachment can be bolted. An enlarged view of this attachment is given in Fig. 2, which will be found to readily explain it. The whole arrangement is swiveled in the small support shown at the right. This is furnished with

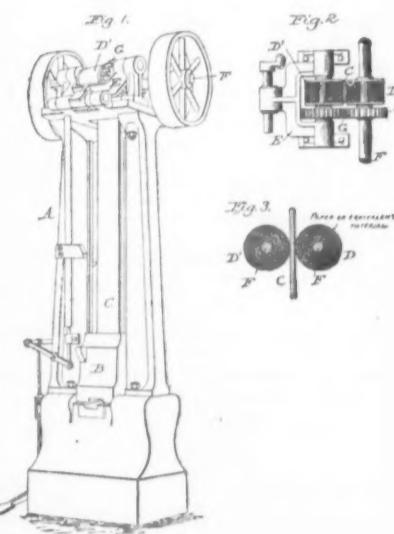
two or more blades or wings grouped upon but one side and unequally distributed about said hub, but in which the distance between the blades is not uniform, and in which no two blades are diametrically opposite, substantially as and for the purpose specified.

2. A propeller having its blades grouped upon one side of the hub or shaft only and in which no two blades are diametrically opposite, and in which the distance between the blades is not uniform, and a non-propulsive counterbalance arranged upon the side of the hub or shaft opposite to that on which the blades are located, substantially as and for the purpose specified.

3. A propeller consisting of a hub provided with two or more blades grouped upon one side of the hub or shaft only and in which no two blades of the group are diametrically opposite, and a single blade arranged opposite to the group of blades, but in which the distance between the blades is not uniform, substantially as and for the purpose specified.

The inventor says of what he has been able to accomplish: "With propellers in which there are a large number of equally

the road, as in our entire experience we have not had one give out. On account of the gases which appear to collect in the cavity made by the core we have found it necessary to drill a $\frac{1}{8}$ in. vent hole through the wall on one side of the head. Mr. E. L. Weingerber states that for the past five years he has been using a solid cast iron head because it can be fitted up for the half the cost of spider and follower head and there is no liability of the follower bolts working out and causing the breakage of cylinder heads and cylinders. Mr. J. Davis



An Improved Drop Press, Built by Williams, White & Co., Moline, Ill.

Barnett says: "we use solid heads and spring the rings over into grooves: would recommend a solid piston head—that is, a head cast completely in one piece, and if properly designed and cored out it can be made as light in weight as a spider head and at one-quarter its cost; there is less risk of failure in a solid head when it is out on the road at its work, and, being cheaper to renew, there is less reluctance felt when the head is worn in throwing it away and putting a new one in."

An Improved Drop Press.

Messrs. Williams, White & Co., of Moline, Ill., are building an improved form of drop press, which we illustrate in the annexed engravings. The usual plan for friction drops has been to use iron rollers, taking hold of a board attached to the hammer. The pressure necessary to hold the board sufficiently to lift heavy hammers soon proves destructive to the wood, and it splinters and must be replaced. To overcome this good quality of paper is used for the rollers in the press illustrated, and it has been found that the adhesion thus secured is better than that of iron to wood. The rollers DD may be made up in various ways—that is to say, they may be composed of a series of disks clamped between metallic end plates, as shown in Fig. 2, or they

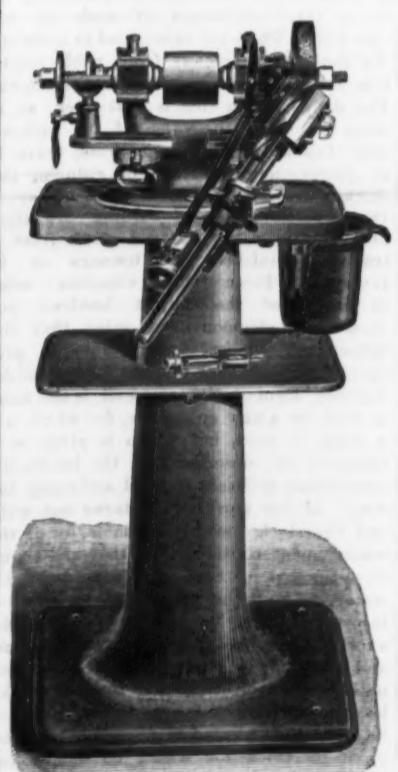


Fig. 1.—General View.

NEW TWIST DRILL GRINDER, MADE BY FRANK MOSSBERG, PAWTUCKET, R. I.

a T-groove on its lower side, and is fixed to the lug on the emery-wheel stand by a clamp screw, more clearly shown at the left in Fig. 1. The support, it will be observed, has a split collar and tightening screw, and the grinding attachment may hence be clamped at any desired horizontal angle. The drill to be ground is placed in a V-shaped jaws and clamped by means of a thumb-screw, having previously been adjusted by the gauge B. This adjustment is effected by bringing the movable jaw to bear only loosely against the drill. Then, with the right hand, the spring gauge B is depressed, and with the left hand the drill is revolved until the point of the lip is brought in contact with the point of the gauge. Then the drill is moved straight forward until it engages with the emery-wheel, and is securely clamped. Feed is obtained by turning the graduated thumb-wheel, shown at the left in Fig. 2. This, by means of a screw and sliding block, causes the grooved rod, clearly shown in the engraving, together with the V-shaped drill jaws, gauge B, and other attachments, either to recede from or advance toward the emery wheel on a dovetail slide, the amount of travel either way being read off from the graduated wheel, and shown also approximately by the position of the sliding block mentioned, relative to two gauge marks on the frame in which it moves. The whole attachment is, of course, capable of being pivoted in that part of the device carrying the stop C. This portion is fixed so far as vertical motion is concerned, but can naturally be turned through horizontal angles, mounted, as it is, on the spindle in the split collar to which we have already referred. The pivot for the vertical swing is arranged in a slide which can be raised or lowered by loosening a clamp screw, enabling a ready adjustment of the clearance. The projecting

distributed blades, the water is so greatly

churned that it is difficult for the blades to

obtain a solid hold in the fluid, and consequently the loss by slippage is very great.

By arranging the blades as described, forming a more open space between them, they

are enabled to take a firm hold upon the

water, and the slip is much reduced, and this reduction is shown in an increase of

speed with a given number of revolutions.

Solid Locomotive Pistons.

In the report of the committee on cylinder packing, submitted at the recent meeting of the American Railway Master Mechanics' Association, some interesting particulars are given relative to solid pistons for locomotives. In response to the question, "Do you use solid heads or spider follower and T-ring?" Mr. John S. Cook reports that he uses solid heads with three grooves $\frac{1}{8}$ inch wide, and holds the piston centrally by means of brass bushes placed in the stuffing-boxes, and which are renewed as often as necessary. Mr. James Mehan reports that he uses solid heads, and springs the rings into grooves; he thinks they are preferable to spider-heads and cheaper. Mr. Schlack's reports that some 12 years ago he commenced using solid cast-iron heads $4\frac{1}{2}$ inches thick, the packing rings being sprung over the head into grooves. He has obtained excellent results from it, and prefers it to the spider and follower. First, because there is no danger of the follower bolts working loose, causing the breaking of the cylinder or cylinder head. Second, it is 50 pounds lighter—that is, 140 against 190. Third, it can be fitted up at one-half the expense of the spider and follower, and is less expensive to maintain when it is well designed and cored out, and the walls properly secured by stay bolts tapped through the head; there is no danger of it falling while on

may be made by winding the paper about the roller shaft until a roll of the required size is built up, as shown in Fig. 3. Instead of either of these plans, the roller may be made of papier mache compressed in a hydraulic press to the desired size and form. The strap C, Fig. 1, is made of steel, though the ordinary wooden hammer strap may be used with good results.

Heavy Gun Trials on Board Ships.

—English papers give particulars of recent practice with the 45-ton guns of the British warship Colossus, carried out of Malta. The object was to ascertain the rapidity with which accurate fire could be delivered, the ship being in motion. For the first time in the history of naval gunnery this was tried with heavy breech-loading guns worked entirely by hydraulic power. Great importance was, therefore, attached to the practice. The ship ran at a speed of eight knots per hour along a measured base distant at the extremes rather over 1900 yards from the target. The results are said to have been highly satisfactory. The heaviest charge of powder was used throughout, and all the machinery is reported to have stood the test admirably. Several times a gun was fired, loaded again, pointed, and fired a second time in $1\frac{1}{4}$ minutes, and four charges of the same gun were completed in six minutes. Every shot struck the target, and out of one series of four very rapid shots, no fewer than three struck it.

A strike of natural gas was reported on the 27th ult. from Auburn, DeKalb County, Ind. The fluid was struck at a depth of 500 feet, and, when lighted, blazed to a considerable height. Drilling was resumed, as it is believed that Trenton rock has not yet been reached.

The Iron Age

AND METALLURGICAL REVIEW.

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REMOVAL.

The Chicago Office of The Iron Age is removed to 95 and 97 Washington Street.

The Position of the Iron and Steel Trades.

Developments during the current month will be all-powerful in shaping the course of trade in many lines in iron and steel for the second half of the year. Late in April we had occasion to point out that there was a tendency toward lower figures in all lines not directly connected with railroad construction. We have not had occasion to record a single advance in May, while in June stiffening in a few directions has been more than counterbalanced by a decline in other specialties. The turning point has been reached in a few articles, and it will be soon evident whether higher values will generally prevail. For nearly four months—March, April, May and June—the trade has been, generally speaking, quiet, and under a tremendous pressure prices have slowly receded. Yet, taking into account how enormous has been the output, it will be conceded that the markets have borne up wonderfully well, with buyers steadily holding off to the last moment. We have advocated that policy when last we wrote, but we believe that the time is fast approaching when a change is called for. The experience in the past has shown that usually a buying movement sets in toward the end of July or early in August. Prior purchases are generally exhausted by that time, since few care to add to their engagements just before closing down for repairs and before taking stock. This year there was a rush of buying in December, January and February, followed by four months of conservative action. It is not unreasonable to suppose that the contracts then made must be drawing to an end rapidly. During that period trade was undoubtedly seriously disturbed by the Interstate Commerce law. Business has now be-

come adjusted to whatever changes it has wrought—changes which we now know to have been far less important than they were generally expected to be. The effort of the railroads to use its enactment as a pretext to heavily advance rates has only been moderately successful, and yet their profits have been very much greater than last year, and are now again close to their normal average. Making due allowance for the many devices resorted to to make their revenues appear heavy enough to warrant full speculation in stocks, enough remains to prove that the railroads are again prosperous. The large lines, notably in the West and South, have launched into new enterprises which have given full employment to our rail mills, bridge shops, locomotive and car works, and renewals have been going on at a liberal rate. As usual, the demand for rails has been far in advance of that of other parts of the equipment, and that gives strength to the belief that many heavy orders for locomotives and cars are still to come. In fact, that movement has already begun. Consumption in other directions is enormous, the agricultural interests being fairly prosperous, while building throughout the country is very heavy, the tendency toward speculation in unimproved property giving way lately to investment in construction. Wages are relatively high, and the purchasing power of the great masses is undoubtedly larger than it has been for many years. It is generally conceded, with the evidences of it on every hand, that the current and prospective demand for iron in nearly all its forms is larger than it ever was before.

The question, so far as the future is concerned, hinges upon the point whether the output is likely to be in excess of requirements or not. Turning first to pig iron, it may be stated at once that the restriction of output brought about by the coke strike in the West has had the effect of checking what threatened to become a serious decline, and we now enter the second half of the year with stocks certainly lower than they were known to be for years. Already the signs are gathering of a hardening tendency there, and the majority of the Southern furnaces, the bugbear of the trade, have filled their order books up to capacity, which has been quite generally overestimated. Whatever may be the influence later in the year, and early in 1888, of the new plants approaching completion, they are not destined to play an important part during the next quarter. In the East the best foundry grades are growing scarcer and only mill iron and off grades persist in weakness. Rails and structural material are provided for the next four months, and the works are pretty sure to pick up enough business to keep them running quite full up to the opening of 1888. In bars, plates and wire the situation is less well defined, although the outlook there, too, has its reassuring features. In nails of all kinds the future is not promising. In old material, which has so long suffered from forced sales, it has been shown lately that any demand for consumption causes a stiffening of prices. In all but a few branches of the iron trade any buying movement of magnitude is likely to cause a rising tendency. The next month will develop this point, and so far as present indications go the chances are rather in favor of higher figures. It was feared widely during the past two months that without heavy orders from this side the foreign markets would display much weakness. Very little new business went abroad, and yet the decline there has been very small indeed. Any indication of purchasing on American account has led to a prompt stiffening, as has been shown during the past week in a number of specialties. Generally speaking, therefore, the outlook is decidedly favorable, although slight disturbances only may turn the scale in the direction of lower prices.

The veteran, Hon. W. D. Kelley, is doing the South good service through a series of interesting letters which he is contributing to the columns of the *Manufacturers' Record*. He is showing his earnest desire to foster its best interests, not alone by speaking enthusiastically of its resources and its enterprise, but also by fearlessly exposing sharp practices which have hurt it and are bound to injure more unless suppressed. In a recent communication, in which he discusses South Pittsburgh, Tenn., he says: "The 'City Pamphlet,' with its 11 full page illustrations, 21 pages of descriptive matter, and 'exquisitely engraved cover,' which had been prodigiously distributed, could not be accepted by settlers as an offset to this and other deficiencies, such as the total want of schools, street lamps and fire apparatus. Indeed, this proposed substitute for the means of common school instruction, dwelling-houses, light and protection from conflagration was much derided in my hearing, as it included engravings of buildings which were yet invisible, and allusions to such imaginary places as a 'cottage bedecked hillside,' &c. But, as I learned from parties who had come a great distance for the purpose of effecting a settlement in a milder climate than that in which they now live, its exaggerations filled strangers with doubt and drove some of them away in disgust." We have heard of a number of cases of disgraceful sharp practices and of stupid "booming," and, while we know that they are exceptional, it is certain that they do harm out of all proportion to their numbers or significance. Southern business men will do well to thoroughly disown such methods.

Railway Stock Watering and Rates.

Interdependence may be traced in the world of political economy, and especially in the different parts of that great question known as the railroad problem. Thus the short haul involves a discussion of stock-watering. In our remarks upon the long and short haul clause of the Interstate law, we said that in the competition between rail and water lines, the physical ability of the railroad to reduce the interior rates to the level of the water tariffs should be carefully considered. Upon this point the commissioners in the recent manifesto, say: "Every railroad company ought, when it is practicable, to so arrange its tariffs that the burden upon freight shall be proportional on all portions of its line, and, with a view to revenue sufficient to meet all the items of current expense, including the cost of keeping up the road, buildings and equipment, and of returning a fair profit to owners. But it is obvious that in some cases, when there is water competition at leading points, it may be impossible to make some portion of the traffic pay its equal proportion of the whole cost. If it can then be made to pay anything toward the cost above what the taking of it would add to the expense, the railroad ought not in general to be forced to reject it, since the surplus, under such circumstances would be profit." This in carefully guarded language means that even water competition is no excuse for making through rates lower than local, unless the higher local rates can be proved necessary for actual expenses and a fair profit. A fair profit upon what? Should watered stock be included as fair capital?

The most common form of stock watering is where the additional stock is issued to represent more nearly the real value of the road and franchise at the time of the issue, which may have largely increased since the organization. Thus, practically such issue represents the increased earning capacity of the road and the increased dividends which its directors assume it can hereafter pay. In this respect, such a railroad is a creature of its time. Rapid fluctuations, as compared with the steadiness of Europe, is the feature of many of our American investments. It is to take advantage of such an advance from whatever cause, and to cover up the increased dividends from public attention, that the water is poured into the stock. The danger from this is that when, as is often the case, the value of the railroad may fall as rapidly as it arose, there is no corresponding method of reducing the stock. Then is put before the managers the impossible task of earning the usual dividend upon the watered stock from a traffic diminishing in tonnage or in revenue. From this situation arises so many of the unjust burdens put upon local shipments, in order that the latter may support the dividends previously paid and now thought indispensable. Another form of the same evil is the issue of stock by a new enterprise, for which not a dollar is paid, but which is given as a bonus to all subscribers to the bonds, the latter being sufficient to build and equip the road. If the new railway turns out well, and the stock becomes valuable, or if the management consider that they are bound from the first to earn dividends upon this water, we have the same result as before—injustice to the helpless by reason of the exorbitant profits demanded by the directors and officials. It is clear that such discriminations between local and through traffic, because of competition at the termini, will no longer be accepted as necessary to a fair profit on stock for which no money has been paid in.

For such stock watering the public is it somewhat to blame. It was made necessary because public opinion had adopted the crude notion that high dividends in some way meant a wrong to shippers. This is far from the truth: there is no necessary connection in railroading between large profits and high rates. By reason of exceptional advantages a railroad may enjoy a large traffic at low rates which may return a good revenue, while another road may charge exorbitant prices on smaller business and not even pay the interest on its bonds. The shares of the New York Chemical Bank are quoted at \$2500 each, yet no one claims that more than the usual interest has ever been exacted or indeed could have been. In somewhat the same way we may say that fare and reasonable rates may be charged by a railroad earning 10 per cent. or more. Practically it is when earnings fall below the average, whether on real or watered stock, that the temptation becomes strongest to oppress the non-competitive points.

Taking this view, what suggestions can be made? First: public sentiment should allow of unusual dividends when there are no proofs of unreasonable charges. Such large earnings will always regulate themselves. This being supposed, we should, secondly, prohibit the issue of new stock without payment therefor, except under unusual circumstances, to be decided by some competent tribunal. With public opinion changed, sentimental reasons for this stock watering will thus pass away. There are other forms of stock watering, such as appear in the history of the Erie Railway, which are really commercial crimes, and which should certainly come under the general prohibition. All these questions are really involved in the Interstate Commerce law and in the rulings which the commissioners will be called upon

from time to time to make. As we have said, this question of stock watering must be one of the factors in interpreting the short haul clause, and also the matter of cost of service in cases where higher freights are put by the railroads upon the interior towns. If this is done to save the dividends heretofore paid upon watered capital, it should not be allowed, even though such water represented at one time the increased value of the road. But here again we need that public sentiment should allow more than 3 or 4 per cent. to be paid by any prosperous railway where no oppression is claimed without protest. We thus keep the balance and permit the fluctuations of traffic and values to take place naturally.

Our Trade with Ceylon.

The import into the United States of certain products of Ceylon during the current fiscal year of the island, commencing October 1, has increased at such a rate that it may not be out of place to enter into some details having reference to developments in that British Indian colony. Ceylon is an island situated in the Indian Ocean, off the southern extremity of Hindostan; its extreme length from north to south is 266 miles, its greatest width 140½. The first settlement was made by the Portuguese in 1505, who were dispossessed by the Dutch in the next century, and these in turn ejected by the British in 1795-1796. By the census taken in 1881, the population was ascertained to be 2,763,084, having increased 15 per cent. since 1871. The total number of plantation laborers is 210,000. The area of the colony is 24,702 square miles, or 16,233,600 acres, on the cultivated portion of which the following products are raised: Rice on 605,000 acres; other grain, 109,000; coffee, 132,000; tea, 93,000; chinchona or quinine bark, 44,000; cocoanuts, 456,000; cinnamon, 35,000; tobacco, 10,000; areca, palmyra and other palms, 100,000; coco, 12,500. The public indebtedness amounted in December, 1884, to £2,193,724. In 1875 the revenue was £1,354,123; in 1884, £1,162,721; the expenditure amounted to £1,220,180 in 1875; in 1884 to £1,154,832.

The telephone has been introduced in Colombo and the principal towns, are connected by telegraph, there being 1150 miles of line in operation. The telegraphs of Ceylon are connected with the Indian system. There are in operation 1300 miles of railway; gravelled roads, 885 miles; natural roads, 622, and canals, 167. In 1884 there was expended on public works, not including railroads, the sum of 1,979,687 rupees. Four different ocean steamship lines keep up communication with India, Europe, the United States via Suez, and Australia.

The trade of the island is as follows:

	Import of Merchandise.	Export.
1875.	£5,361,940	£5,375,410
1884	4,811,451	3,161,303

The export declined in consequence of the leaf disease in the coffee plant, and the comparatively small quantity shipped brought a low price. Planters consequently introduced chinchona culture from Peru, which proved a great success, tea from India, which has also done remarkably well, and quite a variety of other products, such as cocoa, &c. Now that coffee has risen so much in value and the leaf disease has abated considerably, there may be a serious return to that staple, the more so as chinchona culture is being overdone. The chief source of mineral wealth is plumbago, which fluctuates in output as the demand may chance to be and the price it brings in England and America.

From October 1 to April 14 coffee exports declined from 220,772 cwt. in 1883-84 to 113,869 in 1886-87; chinchona rose from 3,500,600 pounds to 8,080,450; tea, from 665,669 pounds to 4,397,339; cocoa, from 6093 cwt. to 13,007; cocoanut oil declined from 211,383 cwt. to 156,679; plumbago, from 128,841 cwt. to 115,282; coir rope, from 8707 cwt. to 4347; coir yarn, from 51,002 to 38,270 cwt., while fiber yarn rose from 6739 cwt. to 9146. Citronella oil, an article chiefly consumed in the United States, increased from 2,385,049 ounces to 4,605,168. The shipments to the United States from October 1, 1886, to April 14, 1887, were chiefly composed of the ensuing articles as compared with the shipments to England: Chinchona, 404,087 pounds, against 7,192,713 to England; tea, 6,425 pounds to the United States and 4,246,235 to England; cocoa, 534 cwt. and 11,571 respectively; cocoanut oil, 62,081 and 52,152 respectively; plumbago, 77,078 cwt. and 36,123; citronella oil, 3,094,648 and 1,592,600 ounces, and cinnamon oil, 9720 and 28,552. The articles of which the United States took so far this year unusually large amounts were consequently cocoanut oil, for soap manufacture, plumbago, and among essences citronella.

Owing to the magnificent geographical position of the island the maritime movement is very large; thus, in 1887 the inward tonnage amounted to 1,758,445, and the outward to 1,752,121. A steady increase has manifested itself since the effect of the large breakwater at Colombo has been felt. It was commenced in 1875 and is now finished, the total cost having been £650,000. Products are so varied in Ceylon because there are 4000 square miles in the Central part forming a mountain zone at an altitude of 1500 to 6000 feet above the sea level. Along the coast the annual mean temperature is 80° F.; 6000 feet above the level of the sea it is 32°. Ceylon is without a doubt in every

respect one of the finest and most promising British colonies within the tropics. Soil, climate, abundant labor, position, and good local administration all combine to render it valuable. To America it is especially important on account of its never-failing plumbago supply.

The Revelations of a Broken Wheat Corner.

For a period covering almost the first half of this year an attempt was made to corner the Chicago wheat market. The source of the orders directing the movement was for a time closely concealed, although at length they were found to emanate from Cincinnati, but they were so ingeniously conveyed that the managers for a long time continued enveloped in mystery. The Chicago representatives of the deal seemed equally mystified with the general public, but as long as the "sinews of war" were forthcoming they continued to act for their unknown principals, and the corner grew in proportions until the magnitude of its operations impressed old habitues of the Chicago wheat market with the feeling that a powerful combination of capitalists, controlling untold millions, was at the bottom of this gigantic deal. The Standard Oil Company were hinted at, and numerous other aggregations of moneyed men were pointed out by the gossips of the Chicago Board of Trade as manipulating this Napoleonic campaign against the sellers of wheat. For it was in many respects a most masterful campaign, indicating complete control by some person or persons of the various circumstances governing the progress of a corner. Every attempt was made by those who were being driven to the wall to secure their deliverance from the merciless force which was crushing them. Other markets were called on for large supplies of wheat to enable them to fill their contracts, but such quantities as were available were for a long time absorbed in the interests of the corner as rapidly as they reached Chicago. Devices of all kinds, known only to the practiced manipulators of the Board of Trade, were tried time and again in the hope that they would succeed in breaking the corner, but they were met and baffled as often as tried.

At length the Chicago elevators were all full to bursting, and warehouses of all sorts throughout the city that had been pressed into service were also filled, and the operators of the corner controlled their entire contents. They then believed that they had the sellers of wheat for future delivery at their mercy, and could put the price up to a figure which would pay them a most excellent profit. But the people of Chicago were plucky, and did not give up the fight. They proceeded to build more elevators. One with a capacity of 500,000 bushels was built in 14 days, an unprecedented feat. They called upon outside markets for increased quantities of wheat, for which storage arrangements were made of a character unanticipated by the manipulators of the corner. At last the in-rolling tide of grain became too great for the endurance of the speculators for a rise, and on the 14th of June they were obliged to succumb to the pressure, causing a panic of proportions surpassing any similar experience on the Chicago Board of Trade. This disaster made the revelation of the principal speculator inevitable, and when he was exhibited to the gaze of the world it was found to be none other than E. L. Harper, of Cincinnati, pig iron broker, iron manufacturer, and recently vice-president of the Fidelity National Bank, of Cincinnati.

It was not the Standard Oil Company, nor a combination of veteran speculators of the Board of Trade whose sharp wits outweighed cash, nor yet an aggregation of millionaires with wealth enough to control the trade of a continent, but it was

charged against him that show an utter lack of principle, he finds "none so poor to do him reverence." Only yesterday he was a king among speculators; to day he is bereft of everything—even of a good name.

The efforts of the Knights of Labor to dis courage strikes and in every way to promote a better feeling between labor and capital are not well received by the old time labor leaders, and serious divisions are springing up between the various labor organizations in consequence. A recent development in this direction concerns the bituminous coal miners of the West. The Executive Board of the National Federation of Miners has issued an address setting forth the failure of the miners of Southern Illinois to demand regular scale prices, in consequence of which the miners of other districts are unable to secure a conditional advance which had been promised them. The federation of miners alleges that this non-action of the Southern Illinois miners is due to the influence of the Knights of Labor, whose chief aim and object, it is charged, seems to be that of antagonizing and defeating the federation in all its undertakings. The Knights of Labor are therefore bitterly attacked, the motto of their order declared to be "a flaunting lie," the organization to be "rotten from center to circumference," and much more to the same purpose. The object of the circular evidently is to drive the miners to the support of the federation, and leave the organization of the Knights of Labor. As a quarrel between two labor organizations it would possess very little public interest, were it not for the fact that it points to another influence at work in the direction of disintegrating the great labor order, which at one time threatened to overpower all opposing interests, and even dictate terms from the centers of political authority.

Sheffield as a Pig Iron Center.

A correspondent sends us the following: The location of this town on the South Bank of the Tennessee River and on the line of the Memphis and Charleston Railroad is well known by the readers of *The Iron Age* to need a detailed description. There are five blast furnaces under construction at the present time at this place, and some account of these may prove interesting. First and most advanced is the furnace by the Sheffield Iron Company, the draft stack, main stack and stoves, of which there are three, being completed, as is also the casting house. Nothing remains now to do but to finish the hoisting apparatus, some roofs, tracks, &c. The size of this furnace is 17 x 75 feet, the stoves are 18 x 50 feet, and the two blowing engines are 48 x 84 inches.

Another furnace plant is that of the Lady Easly Company. Of this the foundations are nearly completed. Much of the machinery and all the firebrick are on the ground. This stack is to be 17 x 75 feet, with 3 Whitwell stoves, 18 x 25 feet. The whole is under contract with Mr. J. P. Witherow. The firebrick used in this furnace and stoves is half Laclede and half Sciota.

The company that is building the other three furnaces is the Alabama and Tennessee Coal and Iron Company. These stacks are located in one line, and the pipes, &c., are so connected as to be available to any one of the stacks. Their dimensions are 18 x 75 feet, or the three stoves for each furnace 20 x 65 feet. They are what is known as the Whitwell-Cowper-Gordon design. The foundations are mostly in, and much of the machinery and ironwork are on the ground. They will be blown by seven engines, 48 x 84 inches, and will be so connected as to be available for any one of them. The brick used in these furnaces and ovens is Sciota and Standard, and all is under contract with Gordon, Strobel & Laureau, with specified time when each shall be completed ready for blast. The Lady Easly and the Alabama and Tennessee Coal and Iron Company's furnaces are under the direct supervision of Mr. Edward Doud, who formerly built the Chattanooga and Cowan furnaces, and later the Citico Furnace of Chattanooga.

The location of the five furnaces is just west of the town proper, although within the corporate limits, on a bluff, or rather plateau, about 100 feet above low water of the river. Each furnace has 20 acres donated to it by the Sheffield Land Company, and all are so located that tracks are run around them on all sides. Another admirable feature of the location is a ravine about 75 feet in depth immediately behind the rear, for the disposal of cinder, &c. The last four furnaces expect to be in blast some time during the middle or latter part of 1888, and, as the parties who are at the head of the enterprises are men of large means, it can only be presumed that they will be pushed to early completion.

The question of the policy of the construction of such large furnace capacity must seem to many to be decidedly premature, in the absence of a well-secured coke supply, but their projectors seem to have taken that question fully into consideration. The Sheffield and Birmingham Railroad have now 51 miles of their line just completed, the last 11 miles of which enter the Warrior coal fields. Thirty-five miles further connects them with Birmingham, on which they are at work and are pushing as fast as possible. The next four months will see this connection made. The last 35 miles run entirely through the Warrior coalfields. At the nearest available point on this line the Tennessee and Alabama Coal and Iron Company have commenced developing the coal and are begun the construction of 1000 coke ovens, which, as soon as completed will be followed by the construction of 1000 more, until 3000 ovens are under operation. The construction of these ovens will dispose of the question of coke.

It has been urged by many that but little ore existed on the line of the S. and B. Road, but recent investigations have proved this to be incorrect. Some large deposits have been developed within about 25 miles of

Sheffield. In addition to this the well-known deposits of Brown ores of Middle and West Tennessee commence at a point about 23 miles north of Sheffield. Through that district the Louisville and Nashville Railroad are pushing their line as fast as possible and will have their line in connection with Sheffield within the next three or four months. Of the quality and quantity of these Tennessee ores there can be little question. Concerning their quality, the history of Tennessee iron making for the last 50 years fully establishes their character. Sheffield is situated on a limestone plateau about 100 feet above the river. Along the entire river bank is a limestone bluff about 75 feet thick, which will afford ample facilities for getting all the lime required.

A few words may not be out of place in reference to the facilities that these furnaces will have for getting their pig to market. All of them are located within 150 feet of low water of the river, and most of them have already trams running to the water's edge for the purpose of getting their machinery, &c., much of which is coming by water. A barge line has already been formed for the purpose of transporting the iron to any of the points on the Mississippi River and its tributaries. Those controlling it have already expressed their opinion that they will contract to lay the iron down from Sheffield at any of the points of consumption that can be reached by river at prices ranging from 50 cents to \$1 per ton. At any rate, water transportation is there, and neither Congress nor any set of individuals can get up a corner on river transportation.

Commodore Sicard on the New Steel Guns.

(From our Washington Correspondent.)

At Meridian to-morrow (July 6) the sealed proposals invited from domestic manufacturers of steel for ten sets of steel forgings for 6 inch breech-loading rifle guns, and one set of chase hoops for a 10 inch breech loading rifle gun will be opened. The estimated total quantity of steel required is 6 tons.

Commodore Sicard, chief of the Bureau of Ordnance, Navy Department, speaking on the subject of the new guns, said to-day:

"The results on the 6 inch breech-loading guns have been so satisfactory that we are anticipating very gratifying results on those of 10-inch caliber. Three are now under way. One will be ready very soon. We will then be able to secure the results of actual tests. Our figures now are computations based on the achievements of the 6-inch guns."

"What are the results of the two calibers?"

"A 6-inch gun weighs about 11,000 pounds. The cartridge is 50 pounds of powder, and the shell weighs 100 pounds. With a muzzle velocity of 2000 feet it will penetrate 12 $\frac{1}{2}$ inches of wrought iron, and at 1000 yards 10 $\frac{1}{2}$ inches, and at 2000 yards 9 inches. The 10-inch guns weigh 26 tons, or about 55,000 pounds. They will throw a 500-pound shell with a 250-pound cartridge 9 miles. With 2000 feet velocity at the muzzle it will penetrate 22 inches of wrought iron, at 1000 yards 20 inches, and at 2000 yards 18 $\frac{1}{2}$ inches. We think our high-power guns will surpass anything now produced abroad. These forgings are independent of the Bethlehem contract, and will be wanted at once. Although there will be some shifting of machinery, the new naval arsenal at the Washington Navy Yard can turn out all the work on guns that we require."

"There are also proposals for steel cast guns for the navy?"

"The last Congress made an appropriation for the purchase and completion of three steel-cast, rough bored and turned 6-inch high-power rifle cannon of domestic manufacture, one of which shall be of Bessemer steel, one of open-hearth steel and one of crucible steel. These will be opened early in August. We will require them to be capable of safely discharging projectiles weighing 100 pounds each, with a muzzle velocity of not less than 2000 feet per second. This should afford an opportunity to test the qualities of cast steel as material for high-power guns. We have no opinions on the relative value of the different materials. We are anxious to see what guns of such material can do, and if any one will contract to make them we will give them a proper test, and will then have some authoritative data. Great strides are being constantly made in the manufacture of gun material and improvements may be expected in guns. We are in the advance now as a nation, and will keep there if the liberality of Congress continues."

THE PROPOSED BATTLE SHIPS.

The Secretary of the Navy has not yet determined the question of the selection of the model for the proposed line of battle ship. The Barrow plan has been recommended by the board, and may be endorsed by the Secretary. The law requires that one of these 1000-ton ships shall be built in one of the Navy Yards. The Brooklyn yard has already been practically settled upon as far as location is concerned. As soon as the plan of the vessel is determined work can commence. It is said in naval circles that it will require between five and six years to construct one of these great floating forts. This is estimated upon the length of time required to build one in England or France, where they have the plant ready to do the work.

WIRE RODS.

Assistant Secretary Maynard, who heard arguments last week against the present classification of the smaller sizes of wire rods, has been absent from the city, and therefore has not yet looked into the arguments pro and con. It is intimated that it will be some days before a decision can be reached.

STEEL INSPECTIONS.

A dispatch received at the office of the Chief Inspector of Steel reports the result of a preliminary informal test of the stern-post of the cruiser building at San Francisco, cast by the Pacific Rolling Mills, as showing a tensile strength of 65,000 pounds, the mini-

mum required being 60,000, and an elongation of 21 per cent., 15 per cent. being the requirements for castings.

THE CORPS OF INSPECTORS.

The corps of officers detailed to conduct these inspections is composed of the following and their stations:

Washington.—Office of the Chief Inspector, Commander Robley D. Evans, assisted by Lieut. F. J. Militigan.

Pittsburgh.—Lieut. Commander H. E. Nichols, Park Brothers; Lieutenants J. A. Rodgers and Ensign K. Kimmell, Linden Steel Works; Lieut. F. W. Coffin, Union Iron Works.

Allegheny.—Lieuts. W. C. Cowles, H. H. Hasley, W. B. Caperton and J. T. Newton, Carnegie, Phipps & Co.

Senickley, Pa.—Ensign J. H. Rohrbacher, Park Brothers.

Phoenixville, Pa.—Lieut. J. H. Coffin, Ensigns P. V. Ladadale and H. Rigby, Phoenix Iron Company.

Chester, Pa.—Lieut. M. F. Wright, Chester Rolling Mills.

Nicketown, Pa.—Lieut. R. Galt, Midvale Steel Works.

San Francisco.—Lieuts. F. P. Gilmore and R. J. Dorn, Pacific Rolling Mills.

Paris, France.—Lieut. B. H. Buckingham, works of Krupp, Germany; Whitworth, England.

LIVELY TIMES EXPECTED IN THE NEXT CONGRESS.

The most lively tilt ever witnessed in the House of Representatives may be expected upon the organization of that body upon its assembling in October or December. It has just leaked out that the leading spirits of the free trade hostility to Randall and his conservative friends on tariff matters have been putting their heads together to revise some plan by which his importance in the business of the House may be reduced to a minimum. In the last congress they succeeded in accomplishing the first step in that direction, by so amending the rules as to take from his committee seven of the regular appropriation bills and assigning them to other committees. They now propose to secure from Speaker Carlisle a promise or a hint, that in the event of his re-election he will relegate Mr. Randall to the floor and will not place him at the head of appropriations.

This scheme coming to the ears of Mr. Randall, he smiled with his usual complaisance quietly remarking: "Well, let them try it." There is no question that Mr. Randall has the whip-hand of his party on questions of organization or tariff. The margin of difference between the two parties on a full vote is but 15, a change of eight being sufficient to transfer the majority to the other side. Conceding the support of Carlisle for re-election by Mr. Randall's friends, should he undertake to displace himself from the Committee on Appropriations, that gentleman and his followers, who number not less than thirty, on such an issue would retaliate by a motion to elect the Committee on Appropriations and Ways and Means. The House has that power, and the friends of Mr. Randall declare that they will exercise it if any attempt should be made to practice any high-handed proceedings upon them. It is very evident that the relations between these two wings of the party are far from reconciled, and some exciting scenes may be looked for when these elements come in contact with each other in the organization and proceedings of the next House.

On Wednesday, the 6th inst., a convention of plow manufacturers was held at the Palmer House, Chicago. It was composed of the plow manufacturers of the Northwest, and important business was transacted, of which no particulars have been received up to the hour of going to press.

A dispatch from Fort Scott, Ark., dated June 28, says that there is great enthusiasm at that place over the discovery of gas in well sunk by the Fort Scott Economy Gas and Fuel Company in quantities far in excess of any well opened in that vicinity. This makes the twelfth well now flowing within a mile and a half of the heart of the city, completely settling the question as to the quantity of gas.

The entire business center of Marshfield, Wis., was destroyed by fire on the 27th ult., caused by a spark from a locomotive. The loss is not less than \$4,000,000. But one store and a few half burned houses are reported to remain of this once flourishing town. On the 28th, about half the business portion of Hurley, in the Gogebic mining district, in the same State, was burned, the loss being estimated at \$80,000.

J. F. Frost, Jr., has been appointed treasurer of the Wilmington and Weldon, Wilmington and Columbia and Augusta Central of S. C. and Albemarle and Raleigh railroad companies, in place of J. W. Thompson, resigned.

Mr. J. P. Clark, of the Tamarack and Oscella Mines, and connected with other Lake Superior enterprises, will build a copper rolling mill at Dollar Bay, Mich., where a town is being laid out, a wharf built and other improvements made.

Some interest was excited in Chicago last week over a report that the great Jumbo gas well, at Fairmount, Ind., had been sold to Buffalo parties who intended to pipe gas thence to Chicago. The purchasers denied the rumor when it reached them a day or two subsequently, stating that the well would be used for local purposes, hinting, however, at a contemplated removal of manufacturers from Eastern points to Fairmount to enjoy the use of the cheap fuel. The former owners of the Jumbo well are now drilling another well to supply the town. Should they fail to strike gas in well No. 2, they will be in an interesting condition, as they have made contracts for a year and buildings are

under construction.

The Joliet Steel Company have declared a dividend of \$6 per share.

THE NEW MILEAGE OF THE FIRST SIX MONTHS.

The *Railway Age*, whose statistics are generally accepted as the most reliable, has gathered figures which show that during the past six months tracklaying has been going on in 37 of the 47 States and Territories, on 136 miles, with the result of adding 3754 miles of main line track to our railway system.

This is a far larger showing of new construction than that for the corresponding period in any previous year excepting 1882, when nearly 5000 miles were laid down in the first six months, and 11,563 in the year. The nearest approach to this was in 1881, when about 2500 miles were reported in the first six months out of 9760 for the year. But in 1886 the returns gave for the first half only 1755 miles, while the work of the year, according to our corrected record, was about 8500 miles.

While it is not safe to base estimates of the total year's work very closely on the record for the first six months, because in some years the work opens much earlier and continues much later than in others, and various other unforeseen conditions affect the result, yet from a study of the field we still feel safe in predicting that the total new mileage laid down in 1887 will not be less than 10,000 miles, with the likelihood of considerably exceeding that, and perhaps surpassing the record of the year of greatest railway construction in the history of the country, 1882. Of the 136 miles—not complete—covered by the table, 85 or 62 per cent., are still in course of extension, while tracklaying is about to begin on a large number of other lines not included in the list. Several of the great railway companies will each lay hundreds of miles of additional track before the year ends. Among them may be named the St. Paul, Minneapolis and Manitoba, who promise to add about 700 miles to the 300 miles or more which they have put down since January 1; the Atchison, Topeka and Santa Fe, whose Kansas City line alone will add about 350 miles before the year closes, while their various extensions in Illinois, Missouri, Kansas, Colorado, Texas and California will probably require 700 or 800 miles more to be laid in the next six months; and the Missouri Pacific, Chicago, Rock Island and Pacific, Chicago, Milwaukee and St. Paul, Chicago, Burlington and Quincy and several other great systems, which each have hundreds of miles in process of construction.

It is not difficult therefore to foresee that 6000 miles or more of track may be added during the coming six months. Of the 3754 miles already laid this year over 2000 miles have been contributed by seven companies as follows: Atchison, Topeka and Santa Fe, under various titles, 632 miles; Missouri Pacific, several companies, 332 miles; St. Paul, Minneapolis and Manitoba, 310 miles; Chicago, Rock Island and Pacific, in Kansas and Nebraska, 252 miles; Chicago, Milwaukee and St. Paul, 215 miles; Chicago, Burlington and Quincy, 21 miles; Southern Pacific, 102 miles. Several other companies have nearly equaled or exceeded some of these figures, but these are given as representative.

The Chicago building trades' lockout has grown to be a wearisome story, but the end cannot be far off. The Bricklayers' Union have rejected the proposition to submit certain questions to the arbitration of a United States Judge, but the Master Masons' Association have decided to agree to the plan of arbitration proposed by the Bricklayers' Union some time ago, according to this plan, five persons are named as representatives of each side, and they are to select an eleventh member of the arbitration committee, who will probably be a Cook County Judge. The master masons have instructed their members of the committee in no case to step outside the principles laid down in the platform adopted at the beginning of the fight. This means that the master masons will insist on the recognition of personal liberty—or, in other words, the right of any man to work or not to work as he chooses, and the right of an employer to engage any man he chooses without the intervention of the union. If the bricklayers' committee are not willing to concede this point at the start, there will probably be an end to the negotiations for the present. The master masons are credited with the progress thus made toward a settlement. They are getting very tired of waiting for business, and are anxious to resume operations. The brickmakers have already done so, in order to have stock on hand when building is actively resumed. Representatives of other lines are chafing at the protracted delay in arriving at a settlement. Together they have exerted a powerful pressure on the master masons in favor of arbitration. Public opinion has strongly backed them up, and, notwithstanding a pugnacious element among the master masons that was disposed to stand out until the strikers joined the new union, the appeal to arbitration has at last been made by both the leading organizations in the fight.

We are indebted to Messrs. Kieckhefer Bros. & Co., Milwaukee, Wis., for their No. 2 illustrated catalogue of their manufactures. The catalogue is an elaborate cloth bound volume, 8 $\frac{1}{2}$ x 11 inches in size, and contains over 200 pages. The contents are arranged in departments, the classification being as follows: Pieced Tinware, Sheet Iron Goods, Deep Stamped Ware, Shallow Stamped Ware, Tinner's Stamped Trimmings, Tinner's Miscellaneous Supplies, Metals, Japanned Ware, Japanned Toys, Japanned Trays, Granite and Agate Ware, Perfected Granite and Agate Ware, Spoons, Wire Goods, Iron Goods, Miscellaneous Goods, Lanterns and Lamps. A department and alphabetical index occupy the last pages of the volume. The book is very fully illustrated, each page containing a number of cuts. Lists of sizes are printed in all cases, but no prices are given. This omission is explained on the ground that as the list prices are frequently changed the book would be rendered useless in a short time. The manufacturers state, however, that they will be pleased to furnish on application price lists on all the goods contained in the catalogue. The volume is gotten up in good taste, and the excellence of the cuts and typography render it a handsome as

well as serviceable volume. The front page of the catalogue presents a general view of the Milwaukee Stamping Works, besides portraits of the proprietors, the Messrs Kieckhefer and Mr. S. Walter.

Iowa Jobbers' and Manufacturers' Association.

The Iowa Jobbers' and Manufacturers' Association met at Dubuque, Iowa, on the 28th ult., for a two days' session. Delegates were present from Des Moines, Cedar Rapids, Sioux City, Ottumwa, Oskaloosa, Fort Dodge, Clinton, Davenport, Dubuque and other Iowa cities. The largest outside delegation came from Des Moines, numbering 18. The convention was opened by President Harbach, of Des Moines, who delivered an address. The afternoon session of the first day was spent in listening to addresses by the State Railroad Commissioners and others. Commissioner Coffin laid particular stress on the fact that the agricultural interests were identified with the jobbing and manufacturing interests. The impression had got out that the farmers were not in sympathy with the other classes, and he, as the representative of the agriculturists, wished to correct that impression. He considered all their interests as identical.

On Wednesday a number of papers discussing business questions of interest were read by the members. The committee on resolutions presented several, which were adopted by the convention, the substance of which was that railroad companies should give Iowa jobbers and manufacturers such rates as would enable them to compete with outsiders; that the advance in passenger and baggage mileage is an extortion, and asking the enactment of a law by the next State legislature establishing a uniform passenger rate of 2 cents per mile; and that the Hennepin Canal should be constructed by the general Government. The new officers are: president, W. H. Torbert, of Dubuque; secretary, W. W. Ainsworth, of Des Moines; executive committee, J. W. Conchar, of Dubuque, George C. Baker, of Des Moines, and A. B. George, of Cedar Rapids. The convention meets

Montross Roofing Specialties.

The Metallic Roofing Company, of Canada, Limited, with office and factory at No. 82½ Yonge street, Toronto, Ontario, are putting upon the market a number of specialties in the line of sheet metal roofs that will interest our readers. Some of them are illustrated in the accompanying engravings. Fig. 1 shows a form of siding which is made under the Montross patents on shingles. It is claimed to successfully allow for contraction and expansion, as well as for uneven settling of the building; accord-

ingly, it is recommended for use for factories, elevators, warehouses, &c. In the size in which it is made, each sheet covers when laid 17½ x 22½ inches. Fig. 2 represents what is known as the company's "No. 1" pattern of shingle. These shingles are provided with a simple side-lock, shown in Fig. 3, which represents an enlarged cross-section. It is claimed for this lock that it forms thoroughly storm proof, telescopic joint, and, at the same time, amply provides for contraction and expansion in any changes of temperature. The upper ends of the shingles are nailed to the sheathing, leaving the lower end and sides free to move by

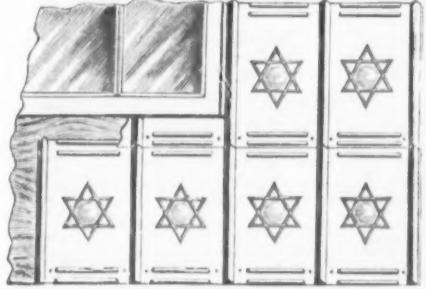


Fig. 1.—Sheet Metal Shingles Used for Siding.

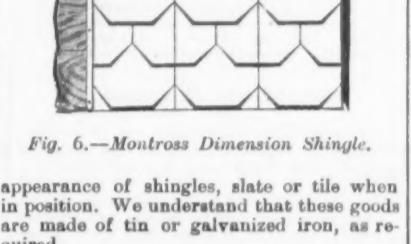


Fig. 2.—Montross No. 1 Shingle.

appearance of shingles, slate or tile when in position. We understand that these goods are made of tin or galvanized iron, as required.

Gong Door Bell.

The Russell & Erwin Mfg. Company, of New York City, are putting upon the market the gong door bell, with push button, illustrated in the accompanying engraving. The appearance of the outside finish is not unlike that of the electric or pneumatic bells that are largely in use at the present time. The button, including its escutcheon, is manufactured in various styles, to agree with the hardware of the door. By pushing upon the button, the shaft or rod connecting with it is forced back in a way to compress the spiral spring shown at the left of the engraving. In moving forward it trips the trigger that controls the hammer of the bell, and in returning to its normal position, by the action of the spring, the trigger is tripped a second time. Accordingly, a single push upon the button results in two quick, hammer-like

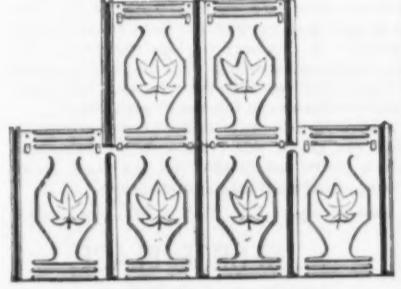


Fig. 2.—Montross No. 1 Shingle.

contraction or by expansion. The lower end is held in position by cleats, which are clearly indicated in the engraving. These cleats are riveted on the upper edge of the lower shingle, and when they leave the factory are in the position shown by the two outer shingles in the lower row in Fig. 2. As the upper course is laid, these cleats are bent up and over the lower end of the upper shingle and thus fasten it in place. By this construction, the makers point out, the nail heads are covered by the course above. The shingles are made of double pattern, as indicated in the cut—that is, each shingle has two figures—and in laying the joints are broken. Thus Fig. 2 represents three com-

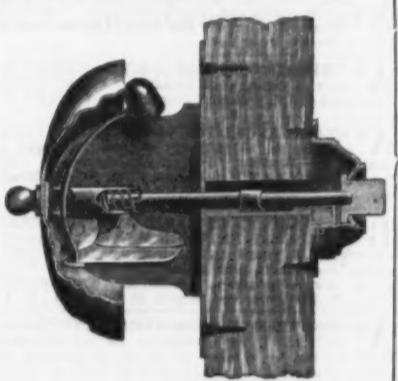


Fig. 3.—Section Through Side Lock.

plete shingles in position. The upper and lower edges are provided with a number of corrugations which serve to break up the surface and stiffen the sheets, and, by a system of interlocking, prevent rain or snow driving through. In laying the courses, lap about 3 inches. The size commonly manufactured covers 15 x 22½ inches.

Fig. 4 represents what the company call its "Perfection" pattern. This device is manufactured of a size to cover 11½ x 12 inches. It is made from square plate, and the edges are of the forms shown by the outlines in Fig. 5. In construction this shingle may be described as an improvement on the celebrated "Canadian" or "Diamond" roofing, that has been so widely and favorably

New Door Bell, Brought out by the Russell & Erwin Mfg. Co.

strokes upon the gong. The gongs are struck up of steel and are handsomely plated, and have a very clear sound. The other parts of the bell are made of the best material, and the mechanism is so simple in character as to make the article very cheap, and yet is of a kind not likely to get out of order. The bells are furnished in different styles to suit the wants of the trade.

Railroad discrimination appears conspicuously in the methods of the Union Pacific Railroad. The investigating commission, which completed its labors at Omaha, received a letter from Guy C. Barton, a friend of the Omaha and Grant Smelting and Refining Company, of Omaha, in compliance with a request of the commission, showing that the total amount of rebates and over-charges paid to that company by the Union Pacific from September 1, 1883, to April 1, 1887, was \$57,011,226, and that the total amount of dividends paid to Fred. L. Ames and Sydney Dillon from the smelting company during the same period was \$30,800 each. Other companies were favored in like manner.

Senator Culom, one of those who were most active in framing the provisions of the Interstate law, says that sufficient progress has been made under the application of the law to justify the opinion that the first result was to place all men more nearly on an equality with respect to advantages in the shipments of their products. The law, he said, in an address before the Illinois Grain Association, marked the beginning of a new era in railroad administration, and is the actual culmination of a long struggle for supremacy between the people and the combined power of the railway corporations. He did not claim the law to be perfect. It was in a sense experimental, but it was a declaration by Congress of its power over the subject, and of its determination that these privileged corporations should be conducted in the interest of the people. "The act will not be repealed," said he, "and if any persons or corporations imagine that they may as well dismiss that expectation. Its substantial provisions have come to stay, because the people will find out, if they have not already, that they are in the interest of

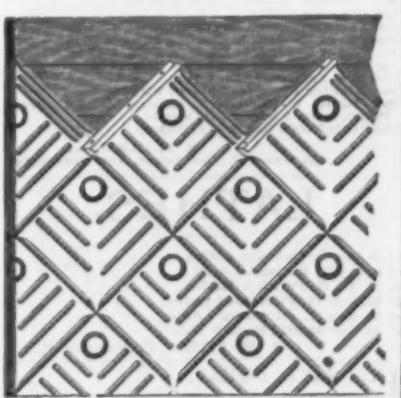


Fig. 4.—The Perfection Pattern.

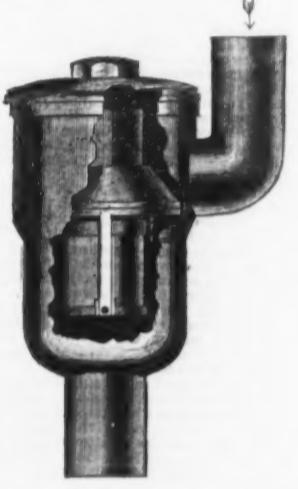
known throughout the country for 75 years or more past. The shingle is claimed to possess the advantage over the so-called "Canadian" roofing of having an expansive lock joint along one of its lower inclined edges and a nailing flange and lock along the opposite edge, as illustrated in the cross-section in Fig. 5. The other edges are provided with certain corrugations that stiffen the plates, causing them to fit more closely together and adding to their appearance on the roof. The makers point out that with this flange the necessity of nailing through the lock or body of the plate is entirely obviated. They also state that these shingles may be laid in horizontal or oblique

courses, as may be preferred. Any number of men may simultaneously work on the same course, an advantage which, it is claimed, no other metal shingles admit of. Accordingly, it is only a question of the number of men, in order to complete the

general welfare." In reference to the long and short haul clause he said: "For many years the railroads of the country have so absolutely controlled our Interstate commerce that we have no means of knowing what are the natural channels of traffic or what would be the effect of the natural laws of trade upon many, at least of the present commercial centers. What the critics of the law call 'natural centers of trade' are centers created by railroad favoritism which has diverted trade from its natural channels into artificial ones at the expense of less favored localities." The Senator said he did not join in the charge that the railroads are attempting to render the law obnoxious. He credited them with too much business sagacity for that. Such a course could only prolong a struggle that would end speedily by quiet acquiescence in the will of the people expressed in the law.

The Sheehan Sewer and Stench Trap.

The Sheehan Sewer Trap Company, Cleveland, Ohio, are putting on the market a trap shown in broken view in the accompanying cut. The course of the water through the trap is indicated by the arrows. The water coming down the waste-pipe fills the top of the trap, but forces an outlet after it has risen to a height of 4 inches—that is, the trap holds a 4-inch seal. The pipe shown in the upper part of the trap-chamber is closed by a valve held in position by a counter-weight. Under a certain pressure the valve is forced down and the water escapes through an annular opening into the bottom of the trap chamber. The valve is kept closed—that is, forced upward to its seat by means of a weight hung below. An ingenious mechanism is employed

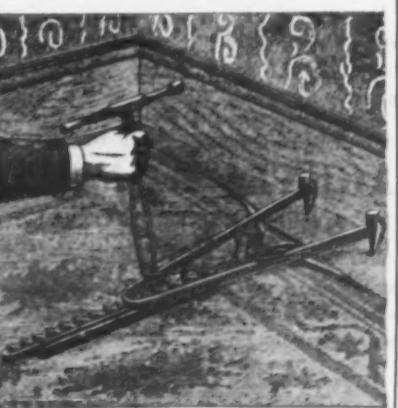


The Sheehan Sewer and Stench Trap.

to transform the downward motion of the weight into an upward thrust against the valve. The interior fittings of the trap and the cap which screws on are made of brass, the body of the trap being of lead or brass, as the case may be. The brass trapping device is removable, but a tight joint is secured by means of a rubber washer. Among the claims made for this trap by the manufacturers is that, in addition to the water seal, it is provided with an air, gas and water-tight valve. It is further said that the trap is absolutely free from the danger of clogging, is constructed on the balance principle, and all parts are interchangeable. The Sheehan traps are made in full S, half S and running, in various sizes and in nine different styles.

The Keystone Carpet Stretcher.

This article is put on the market by Pickett & Rogers, Warren, Pa. It is represented in the accompanying illustration, which indicates also the manner in which it is used. This carpet stretcher consists of three parts, one having the clamp which holds the carpet, another which is secured in the floor next to the base-board, and the lever by which the power is applied in stretching the carpet. This lever also, after the carpet has been stretched to the desired extent, serves the purpose of a hammer. It will be observed that this stretcher is so constructed that, after the carpet has been placed between the jaws of the clamp, the force exerted by the lever tightens the grip of the clamps, and the force being continued moves the clamp, and, consequently, the carpet in the



The Keystone Carpet Stretcher.

desired direction. As the carpet is forced in place it is held by means of a ratchet, which engages with the rear portion of the part which is fastened in the floor, thus permitting the removal of the lever or hammer for driving the tacks. These stretchers are made entirely of malleable and wrought iron. The efficiency with which they do their work, the ease with which they are operated, and the fact that they clamp the carpet in such a way that they cannot tear or injure it, are points made by the manufacturers

New Eave Trough Hanger.

A new adjustable eave trough hanger, to be known in the trade as the Improved Yankee, is offered by the Moore & Barnes Mfg. Company, 103 Chambers street, New York. The larger of the two engravings used herewith shows the details of the device,

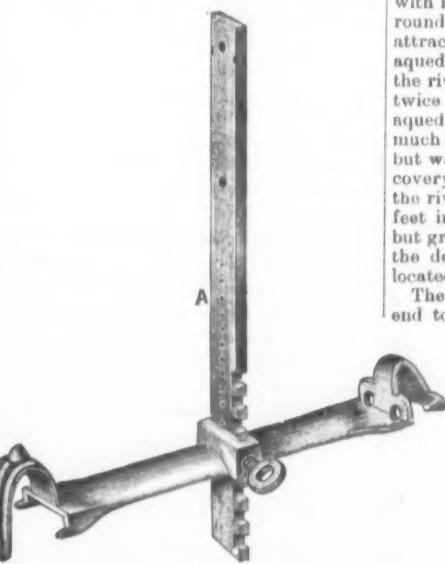


Fig. 1.—The Improved Yankee Adjustable Eave Trough Hanger.

while the other shows the application to a roof. The cross bar is provided with points or punches at each end. One end is adapted for receiving the bead of the gutter, and the other to engage with the back edge. The strap, in addition to being perforated for convenience in nailing, is marked on one side by a series of dots. These constitute the bending gauge. The distance between the dots is right to give the proper fall to a gutter attached to a horizontal eave, if each succeeding hanger is bent one point lower. In addition to this there is a 3 inch adjustment provided in the thumb-screw, and notches on the side of the strap. Among the advantages to which the makers direct attention may be mentioned the neat appear-

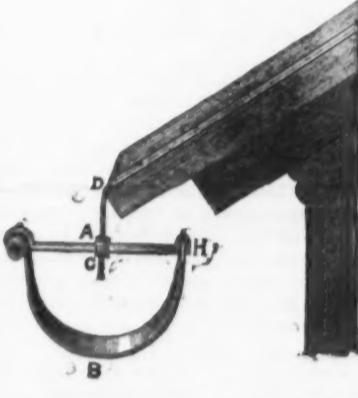


Fig. 2.—Gutter Hung with the Improved Yankee Hanger.

ance of gutters hung by this device, the rapidity with which work can be done, and the ease with which work can be taken down for repairs or painting.

Progress on the Aqueduct.

The new aqueduct to supply New York City with water is approaching completion much more rapidly than is generally supposed. Already 90 per cent. of the excavation is finished, and about 30 per cent. of the brick lining; and, unforeseen accidents barred, the entire work will be completed before the end of the present year. Thus will be given to New York another notable marvel of modern engineering, and a work which will command the attention of scientific tourists and students for many years to come before it shall be rivaled in magnitude.

A few general figures will give a better conception of this work than now obtains. The aqueduct is in reality a continuous tunnel, thirty miles in extent, with a sectional area of 155½ feet, or sufficiently large to accommodate an ordinary train of cars. It traverses a broken country, now beneath lofty hills, again crossing deep valleys; driving at times under broad rivers; most of the way cut in solid rock, its average depth beneath the surface being about 150 feet. Excepting where it is carried under water courses, it maintains a perfectly regular though slightly descending grade, and yet will deliver its vast river of water at the highest elevation on Manhattan Island, thus giving a head for distribution which will carry it to the tops of the loftiest buildings.

The present aqueduct has a sectional area of but 53½ feet, or but a trifle more than ½ of the new. Thus the new will be capable of furnishing the city three times the volume of water which the old aqueduct could convey, even when pressed to its utmost capacity, as it has been for several years past, to the great anxiety of the engineers and others concerned. Indeed, the public has happily not appreciated the very great danger to which the city has been subjected of late years on this account. The old aqueduct is a comparatively light structure, running near the surface, and never intended in its construction to withstand any internal pressure. It could carry with perfect safety two-thirds or three-quarters its full capacity, but was never intended to be completely filled. But of late years it has been crowded and compelled to carry the last possible gallon, thus subjecting it to continual pressure and a liability to burst at any time. And while thus forced to its utmost, it has been unable to supply any excess of water, so that should any accident befall it the city

would be brought face to face with a water famine of the most serious character. In the construction of the new aqueduct, one of the most notable pieces of engineering is the crossing of Harlem River. Everybody knows that the old aqueduct crosses on the High Bridge at an elevation of 120 feet above mean high water. That lofty bridge, with its massive stone piers and beautifully rounded arches, has long been one of the attractions of the metropolis. The new aqueduct, however, passes under the bed of the river at a depth of 225 feet, or nearly twice as far below the water as the present aqueduct is above it. This great depth is much more than was originally contemplated, but was found necessary because of the discovery of a fissure in the rock underlying the river. This fissure was found to be 12 feet in width near the bottom of the river, but gradually narrowed until it was lost at the depth at which the tunnel was finally located.

The tunnel is to be lined with brick from end to end, and at the crossing of rivers is additionally strengthened by iron tubing. It passes under the Harlem in the form of an inverted siphon, or a letter V, and, of course, will be subjected to immense strain at the lower angle. This strain is met by doubling the thickness of the brick lining and the addition of the iron tubing already spoken of. A little distance above the Harlem River, between shafts 13 and 14, a very troublesome body of quicksand was encountered which baffled all the efforts of the engineers to overcome. When struck it ran into the tunnel with such force and rapidity that the workmen barely escaped

with their lives, running at their utmost speed. It filled the tunnel back to the shaft, and months of work were vainly expended in the effort to exhaust it. Then an additional shaft was sunk midway of the bad land, through which drainage was established, and only recently has progressive work been rendered possible at that point. The contractors, Clark & O'Brien, expended nearly a quarter of a million of dollars in seeking to overcome that troublesome encounter before they were relieved by the extra shaft. Returning to details of the work, which was begun in May, 1885, the exact length of the aqueduct, including 818 feet of open cut, is 104,804.4 feet. Of this the contracts of Brown, Howard & Co. covered 66,771.9 feet, of which the excavations are completed on 58,329.9 feet, leaving 8442 feet to be completed. Clark & O'Brien's contracts cover 73,099.5 feet, of which they have finished 71,763.5 feet, leaving 6336 feet yet to be accomplished. John Brunton & Co. are contractors for 11,810 feet, all south of the Harlem River, of which they have completed 8536 feet, leaving 3274 to be excavated. The cost of the work in dollars and cents up to June 1 has been \$10,235,666.07, of which \$49,152.14 was paid for land and land damages, \$314,111.47 on account of commissioners of appraisal, \$8,945,288.56 for actual work of construction, and \$927,113.90 for salaries, supplies, examining engineers, rock borings, &c. But the dollars and cents are only a portion of the cost of the great work. There has been a very large sacrifice of human life and limb in the work, which must be added to the account. Up to the 1st of February last there had been killed on the entire work 70 men, and 116 more or less seriously wounded. Since that date there have been a number of additional accidents, materially extending the list of casualties. Of those given, 39 dead and 58 wounded are chargeable to the account of Brown, Howard & Co.; 28 dead and 51 wounded to Clark & O'Brien; 2 dead and 7 wounded to John Brunton & Co., and 1 dead not located.

But the completion of this aqueduct with the present year will give to the city no additional supply of water, merely removing the danger of an absolute stoppage of all supply, and providing a means for conveying more water when it is obtainable. The present aqueduct is capable, so long as it may stand and perform the extra duty put upon it, of conveying to the city all the water collected by the present Croton dam. But that dam by no means retains all the water of the Croton River. To secure that full supply a system of new dams has been devised and is embraced in the new aqueduct scheme. One of these, the Sodom dam, is intended to catch and store the water of the east branch of the Croton, holding it for use when required. The preliminary work for securing the land required for that dam and reservoir is now well advanced. The Muscoot dam takes the water above the level of the Croton dam, and in like manner stores it to be fed to the lower or main reservoir, as needed. That work has been ordered, and the surveys and designations of lands required are in progress. Finally, the Quaker Bridge dam proposes to catch all the water of the Croton water-shed and store it immediately at the entrance of the new aqueduct, to be drawn upon at all times. That dam, and the land it will submerge, will cost from \$7,000,000 to \$10,000,000, and has been decided upon with great hesitancy. It will require a number of years to build it, and when completed it will be the greatest dam in existence. The Sodom and Muscoot dams will supply all the water required until the Quaker Bridge dam is completed, and that will then supply the anticipated wants of a quarter of a century to come. The work on these dams should have been begun several years ago. As it is, the new aqueduct will be completed at least two years before it will have any more water to carry than is now being brought to the city.

Secretary Fairchild has addressed a circular letter to importers of steel wire redating the claim of the American Iron and Steel Association that importations of steel wire rods smaller than No. 5 wire gauge should be classified for duty at the rate of 1½ cents per pound as "steel wire," and saying that if the importing interests desire to be heard on that question they will be given an opportunity to do so any time after July 7.

CURRENT HARDWARE PRICES,

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturer's name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps

Lawn Mowers. Standard Machines.....	dis 50 & 5¢
Cheaper Machines.....	dis 50 & 10 @ 60¢
Lemon Squeezers.	
Porcelain Lined, No. 1.....	W. doz. \$6.00, dis 25 & 30 \$
Wood, No. 2.....	W. doz. \$3.00, dis 35 \$
Wood, Common.....	W. doz. \$1.70 @ 1.75
Dunlap's Improved.....	W. doz. \$1.50 @ 1.50
Seeger's.....	W. doz. \$1.50 @ 1.50
Jennings'.....	W. doz. \$2.50
The "Boss".	W. doz. \$2.50
Dean's.....	Nos. 1, W. doz. \$0.50; 2, \$3.50; 3, \$4.00
Little Giant.....	W. doz. \$0.50 & 25¢
King.....	W. doz. 40¢ & 5¢
Lines.	
Cotton and Linen Fish, Drapery's.....	dis 50 \$
Drapery's Hawk.....	dis 60 \$
Brown's Metal Lines, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25, dis 25 \$	W. doz. \$1.20, dis 6 to 7, \$13, dis 60 & 5 @ 60 & 10 \$
Wood, Common.....	W. doz. \$1.70 @ 1.75
Dunlap's Improved.....	W. doz. \$1.50 @ 1.50
Seeger's.....	W. doz. \$1.50 @ 1.50
Jennings'.....	W. doz. \$2.50
The "Boss".	W. doz. \$2.50
Dean's.....	Nos. 1, W. doz. \$0.50; 2, \$3.50; 3, \$4.00
Little Giant.....	W. doz. \$0.50 & 25¢
King.....	W. doz. 40¢ & 5¢
Picks.	
Railroad, 5 to 6, \$12.00; 6 to 7, \$13, dis 60 & 5 @ 60 & 10 \$	W. doz. Eye, 5 to 6, \$12.00, dis 6 to 7, \$13, dis 60 & 5 @ 60 & 10 \$
Base Head, Sargent's Hat.....	dis 50 & 10 \$
Brass Head, Sargent's Hat.....	dis 50 & 10 \$
Porcelain Head, Sargent's Hat.....	dis 50 & 10 \$
Porcelain Head, Combination Hat.....	dis 40 & 10 \$
Picture Nails.	
Base Head, Sargent's Hat.....	dis 50 & 10 \$
Brass Head, Sargent's Hat.....	dis 50 & 10 \$
Porcelain Head, Combination Hat.....	dis 50 & 10 \$
Pipe, Wrought Iron.—List March 23, 1887.	
1/4 and under, Plain.....	dis 40 \$
1/4 and under, Galvanized.....	dis 30 \$
1/4 and over, Galvanized.....	dis 40 \$
Boiler Tubes.....	dis 45 \$
Pipes and Plane Irons.	
Wood Planes—	
Hornbeam Plane.....	dis 40 @ 40 \$
Bench, First Quality.....	dis 50 & 5 \$
Bench, Second Quality.....	dis 50 & 10 \$
Iron Planes—Stanley R. & L. Co.,	dis 30 & 10 \$
Micellaneous Planes (Stanley R. & L. Co.).....	dis 20 & 10 \$
Victor Planes (Stanley R. & L. Co.).....	dis 20 & 10 \$
Steer's Iron Planes.....	dis 35 @ 35 \$
Meriden Mal. Iron Co.'s Iron Planes.....	dis 30 & 10 \$
Royston's Iron Planes.....	dis 40 \$
Birmingham Planes Co.....	dis 40 \$
Piano Irons.	
Hall's Irons.....	dis 20 & 10 \$
Piano Irons, Butcher's.....	W. doz. \$50 & 10 \$
Plane Irons—Middlesex Mfg. Co., "Baldwin Iron,"	dis 20 @ 25 \$
Single and Cut.....	dis 25 @ 25 \$
Double.....	dis 30 @ 30 \$
L. J. C. File Plane.....	dis 25 \$
Pliers and Nippers.	
Burton's Patent.....	dis 30 & 10 @ 40 \$
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., \$1.50; No. 4, 7 in., \$2.00, W. doz. 20 & 25 \$	W. doz. 25 \$
Hawkins' & Beckley Mfg. Co., "Wright's Pliers,"	dis 50 & 10 \$
Gas Pliers, Custer's Nickel Plated.....	dis 60 & 5 \$
Bureau Pliers and Nippers.....	dis 40 \$
Russell's "Cutter," Parallel.....	dis 30 & 10 \$
P. S. & W. Timmer's Cutting Nippers, add 6 \$ to 10 \$	W. doz. 25 \$
Morrill's Parallel, per doz., \$12.....	W. doz. 25 \$
Clegg's Patent, \$10.....	W. doz. 25 \$
Deits' Flat Key.....	dis 30 & 10 \$
Deits' Flat Key Latches.....	dis 30 & 10 \$
Romer's Night Latches.....	dis 35 \$
Taylor new list "Superior" U. S. "Fiction American" Seed's No. Y. Hasp Lock.....	dis 30 & 10 \$
Jewels—	
Eagle, Gaylord Parker and List March, '86, revised	
Deits, Nos. 36 to 39.....	dis 10 \$
Deits, Nos. 51 to 63.....	dis 40 \$
Stoddard Lock Co., "Cutter".....	dis 30 @ 35 \$
Yale New list "Night Latches".....	dis 35 \$
Barnes Mfg. Co., "Fiction American".....	dis 40 & 10 \$
Eagle and Corbin Frank.....	dis 35 \$
Champion's Cabinet and Combination.....	dis 35 \$
Yale.....	dis 25 \$
Fadoes, Locks, etc.—	
List, Dec. 30, '86, chgd Feb. 2, '87, dis 50 & 10 @ 55 & 10 \$	
Heading Hardware Co., list Jan. 1, '86, 70 & 10 @ 70 \$	
Livingston & Co.....	
Perkins' "Surgeon".....	dis 60 & 25 \$
F. Manz's "Extension Cylinder".....	W. doz. 10 \$
Barnes Mfg. Co.,	
Yale Flat Key.....	dis 35 \$
Deits Flat Key.....	dis 30 & 10 \$
Deits' Flat Key Latches.....	dis 30 & 10 \$
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Trade Report

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, July 6, 1887.

Scotch Pig.—The market is little steadier. Scotch warrants are 42/3. Manufacturers' brands are quoted as under:

Cottess, alongside, Glasgow	54/6
Langloan	50/6
Glengarock	48/6
Gartsherrie	49/6
Shotts	49/6
at Leith	49/6
Colmellington	44/6
Carron	43/6
Ezlington	43/6
Sunmerrie	52/6
Carriage from Ardrossan to Glasgow	11/9 ton.

Bessemer Pig.—The market is unchanged. We quote W. C. Hematites, Nos. 1, 2 and 3, 44/ @ 45/.

Cleveland Pig.—The market is unchanged at the following prices: 37/ for No. 1 Foundry; 36/ for No. 2; 35/ for No. 3, and 34/ for No. 4 Forge.

Bessemer Billets.—Bessemer Billets, 2 1/2 x 2 1/2 inches, are 72/6 @ 75/.

Bessemer Blooms.—There is a noticeable effort to pull the market, and fluctuations in both directions may be looked for. Prices are nominally 75/ @ 77/6, 7 x 7 inches.

Bessemer Crop Ends.—We quote run of mill 52/6 @ 54/6.

Manufactured Iron.—The market is irregular. We quote:

	£	s.	d.	£	s.	d.
Staff, Ord. Marked Bars	6	0	0	6	10	0
" Medium "	5	0	0	5	10	0
" Common "	4	15	0	5	0	0
Hoops, 20 W. G. and over	5	0	0	5	10	0
" Common Best "	5	0	0	5	10	0
" Medium "	5	10	0	5	10	0
" Common "	5	0	0	5	10	0
Sheets, 20 W. G. and under	5	0	0	5	15	0
" Ordinary Best "	6	5	0	6	15	0
" Common "	5	10	0	5	0	0

Welsh Bars are quoted £4.2/6 @ £4.5/.

Steel Rails.—The market is still irregular and prices have fallen off to £4 @ £4.5/.

Old Rails.—The market continues irregular, with prices for T's and Double Heads, c.i.f. New York, 60/ @ 65/.

Scrap.—The market is unchanged, with Heavy Wrought at 50/ @ 55/, c.i.f. New York.

Copper.—The market is a little weaker. Chili Bars closing £39.10/ @ £39.15/, and Best Selected £45 @ £45.10/.

Tin.—The market closes a little steadier, with spot and futures at £102.15/ @ £103.5/.

Tin Plates.—The market is firmer and 3d. higher on common Cokes. We quote:

Tin Plates, 10x14, 1st qual. Charcoal	17	@	18
" 3d " "	16	@	18
" 1st " Coke	14.6	@	15.6
" 3d " "	19.6	@	14.6

Spelter.—The Market is steadier. We quote £14.10/ @ £14.12/6.

Lead.—We quote Common English £12.5/.

Freights.—Steam freights from Glasgow to New York have advanced to 10/5, and Liverpool to New York 8/ @ 9/.

Financial.

Office of The Iron Age,
WEDNESDAY EVENING, July 6, 1887.

A short and uneventful week affords but scanty material for a commercial report, but the general drift is in favor of renewed activity at the close of the summer months. The temporary disturbance in commercial circles arising from the rupture of the wheat deal has given place to a more settled feeling and renewed confidence. The period of financial stringency looked for in connection with the July settlements has also passed by without serious embarrassment, but the course of the money market will be observed for some time to come with unusual interest, particularly on account of the low condition of the bank reserves. On Friday, July 1, holders of stocks were compelled to pay all the way from 6 to 51% for money to bridge over the holiday period extending from the close of business on that day to Tuesday, the rate closing from 7 to 8%. The really favorable feature is the improved aspect of the crops in the Northwestern wheat belt, where timely rains at a critical period brought welcome relief. Everywhere corn looks well, and in the South the cotton plant, now just approaching maturity, affords every assurance of an abundant yield. A large portion of the wheat crop in Southern Illinois has been already secured. The industrial situation improves, only trifling disaffection among workmen being reported in any direction. The adjustment of the wages question in the Western iron mills on a basis of 10% advance is among the latest settlements.

Reports of railroad earnings indicate active transportation on all the principal lines. The New York Central surplus for the quarter ending June 30 was \$1,360,000, a sum rarely if ever before equaled during a like period; Lake Shore's surplus for the half year was \$1,750,000, which was only equaled in 1879 and 1880; Michigan Central and Canada Southern make reports of like character, and yet these roads are said to have derived no advantage from the workings of the Interstate law.

The Stock Exchange markets early in the week recovered from the previous extreme declines caused by the crash in Manhattan elevated, but to-day there is a return of weakness, Manhattan dropping two points

to 117, and Western Union, New England and Pacific Mail were all lower. All through the week the attendance at the Board was light and little interest manifested, except by professional speculators. Saturday and Monday being holidays, transactions were naturally restricted. Quotations at the close are as follows: Canada Pacific, 59; Delaware, Lackawanna and Western, 133 1/2; Erie, 31 1/2; Kansas and Texas, 28 1/2; Lake Shore, 97 1/2; Michigan Central, 88; Manhattan Consol., 117; Missouri Pacific, 102 1/2; Nashville and Chattanooga, 81 1/2; New York Central, 100 1/2; New York and N. E., 50%; New York, Susq. and West., 103 1/2; Northwest, 118 1/2; Oregon Navigation, 98; Pacific Mail, 43 1/2; Pullman Palace Car Company, 151; R'dg a. p. 56 1/2; St. Paul 87 1/2; St. Paul and Omaha, 50 1/2; Union Pacific, 56 1/2; Wash. and Western Union Tel., 76 1/2; Louisville and Nashville, 61 1/2; North Pacific, 33 1/2; St. Paul and Duluth, 81 1/2.

United States bonds closed as follows:

U.S. 4½%, 1891, coupon	109	@	109 1/2
U.S. 4%, 1897, coupon	128	@	128 1/2
U.S. Currency 6s, 1893	123	@	123 1/2
U.S. Currency 6s, 1896	129	@	129 1/2
U.S. Currency 6s, 1897	129	@	129 1/2
U.S. Currency 6s, 1898	132	@	132 1/2
U.S. Currency 6s, 1899	134	@	134 1/2

The general markets are uniformly dull.

A squeeze in June wheat was settled on the basis of \$1.07. For spots, prices are in favor of the seller. Dry goods jobbers are awaiting the decision of the trunk line authorities respecting the reclassification of freights before making shipments for the fall trade. Pacific Coast tariffs, Eastbound and Westbound have mostly been extended beyond the date of expiration. Coffee is quiet and firmer, quotations nominal. Cotton spots active and 1 1/2 lower. India-rubber in moderate demand. Leather steady. Provisions are dull and easy, and stocks largely increased despite the loss of some 4,000,000 lb burned at Chicago. Ocean freights to Liverpool are generally higher.

The public debt statement for June shows that the debt decreased during the month \$16,852,725. For the entire fiscal year the decrease is \$109,707,646. The debt is now \$1,688,229,591 principal, and \$12,542,357 interest, making the total indebtedness \$1,700,771,948. Deduct cash in the Treasury and available cash items, and the net debt stands \$1,279,428,737. Since the 1st inst., when the 149th call for \$19,716,000 3% bonds matured, \$15,512,600 of the bonds have been redeemed by the Treasury Department. The expenditures so far this month exceed the receipts by over \$9,000,000, and there is every indication that the Treasury surplus will be reduced to about \$36,000,000 by the last-named date. The weekly bank returns show an increase of \$305,075 in surplus reserve, and loans were contracted \$1,931,100; deposits were down \$2,073,100. The balance at the Clearing House on Saturday was over \$11,000,000, being the largest in the history of the institution with one exception, that of July 1, 1879. The transactions on the last day of the week amounted to over \$200,000,000. The total Clearing House returns for 35 cities aggregate \$1,251,154,614, against \$1,008,999,364 in 1886. This makes the percentage of increase, as compared with last year, 23.9%, against a gain of 7.4% the previous week. The total for the week is \$377,510,286, against \$328,739,339 last year. The exhibit is a favorable one, both when compared with that of the previous week and with the one for the corresponding week of last year, nearly all the large prominent cities showing heavy gains. Omaha heads the list, the percentage of increase at that point amounting to 63.3%, followed by St. Paul, Wichita, Minneapolis, Indianapolis and Kansas City.

Rates for money are 6% for 60 to 90 days; four months, 6 @ 7%; sales of commercial paper are only nominal. The posted rates for bankers' sterling are \$4.84 @ \$4.85 1/2. The market is dull and heavy. The Bank of England rate of discount is unchanged. Money is firm in London in consequence of gold exports to the United States and Germany, and the impending export to South America, which, if the movement continues, will involve a rise in the bank rate. According to the Custom-House report, the exports of specie from this port for the week were \$369,000 and the imports \$80,000, making the total since January 1 \$9,970,000 and \$6,062,000 respectively, as against \$42,277,000 and \$6,000,000 for the corresponding period in 1886.

The imports of merchandise at this port during the past week were \$364,000 above those of the previous week, the valuation being \$9,570,575, making the total since January 1 \$236,005,000, against \$217,005,000 for the same time last year, and \$194,307,000 in 1886. The exports were valued at \$5,870,586, making a total since January 1 of \$151,069,000, as compared with \$158,841,000 for the same time last year. The items include 1,346,150 bushels of wheat, 6349 bales of cotton, 11,983,000 barrels of petroleum and 3,632,000 lb bread.

The business failures of the week include the large dry goods firm of John Slade & Co., of this city, who give preferences to the amount of \$202,110. The Mercantile Agency of R. G. Dun & Co. reports that for the first half of 1887 the failures in the United States are 4912 in number, as compared with 5156 for the same period in the previous year, showing a decline of 24.4%. The liabilities were \$55,138,000, as against \$50,434,000 for the first half of the year 1886. The failures in Canada include liabilities for the first half of 1887, amounting to \$10,693,015, against \$5,591,697 for the corresponding period of 1886.

There is little change in the condition of the Steel Goods market, prices ranging substantially the same as a year ago. The manufacturers have recently been conferring, with a view to the adoption of some

General Hardware.

The month opens with a comparatively small demand, but the condition of the market is regarded as exceptionally satisfactory, and the prospect for the season's trade is regarded as very good. Prices are without material change, and manufacturers are showing a commendable disposition in refusing to make concessions. The prevailing prosperity of the country at large, and the increasing consumption of goods are features that point to a good business in the near future.

NAILS.

The New York Nail market has shown some signs of improvement, largely because the low figures made by a few sellers for some time past have been withdrawn, and \$2 for carload lots is the lowest figure now quoted, with little or no cutting for second hands. We quote \$2 @ \$2.10 for carload lots, and \$2.10 @ \$2.20 for lots from store. A number of plans are being advocated in behalf of a pool, and there is much discussion of the revision of the extra list which is likely to be taken in hand at an early date.

BARB WIRE.

The market is quiet, with carload lots of Four-Point Galvanized at 4.10¢, 3 ton lots at 4.30¢, and 4.40¢ for smaller lots.

The Washburn & Moen Mfg. Company are reported to have suffered a serious check in sustaining their Barb-Wire patents in the United States Circuit Court at St. Louis on the 28th ult. The company had brought suit against the Freeman Wire Company for infringing the Burnell patent recently purchased from the Iowa Steel Barb Wire Company. The Freeman Wire Company alleged that the Washburn & Moen Mfg. Company and the Iowa Steel Barb Wire Company had entered into a conspiracy to test the Burnell patent in the courts. When these facts, based on affidavits, were brought before Judge Thayer, he refused to issue an injunction.

The assignee of Sherman & Marsh and Schnabel & Co., Barb Wire manufacturers, of Chicago, who failed some time ago, reports that every pound of the Barb Wire and plain Wire belonging to these bankrupt estates has been sold, and is now out of the market entirely. Thus an element which at one time threatened serious disturbance of regular prices has been happily removed without causing any trouble. The stock embraced about 1000 tons of Barb Wire and 5000 tons of plain Wire. The stock sold included the H.P. Nail Company's Wire, which was the subject of litigation. Although the company won their suit they concluded to forego their advantage, as the estates would have been tied up for an indefinite time, and a final settlement postponed to the annoyance of all parties. The two Barb-Wire plants are now offered for sale. One is located at Grand Crossing and one at Deering Station, both in the vicinity of Chicago. N. B. Judah is assignee in charge, and his office is in the Adams Express Building, Chicago.

MISCELLANEOUS PRICES.

A new list on Iron Wood Screws has been adopted by the manufacturers, and a copy of it is given above. The list for Brass Screws remains without change, as do also the discounts on both Iron and Brass Screws. A comparison of the new list with the old shows that a material reduction has been made in the list of prices of the smaller sized Screws. With the repeated and large advances which have from time to time been made in Screws, an opportunity was given for the importation of Screws of the smaller sizes, and of late some invoices of such were imported, with a prospect of such importation becoming a regular feature of trade. To correct this condition of things this new list is issued; but while it makes a reduction in the price of the small screws, it is to be observed that the manufacturers have covered themselves from diminished profits from this enforced concession, as corresponding advances have been made in the price of the larger sizes of Screws. On a representative order it is estimated that the price will be slightly advanced, and the aggregate of the list prices of the new list are about 5 per cent. in excess of the aggregate of the list prices of the old list. The prices at which the goods previous to this change were sold by the jobbers were, perhaps, slightly higher than those which had prevailed, the trade recognizing the firmness of the manufacturers' prices. The effect which the reduction in price on the small sizes will have remains to be seen.

J. C. McCarty & Co., agents for L. Coes & Co., and John H. Graham & Co., agents for A. G. Coes & Co., announce in a joint circular, dated July 1, a continuation of discount 55 per cent. on

IRON WOOD SCREWS.

List of July 1, 1887.

Nos...	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	22	24	26	28	30
Inches	Cts.																								
1/4	30	30	30	30	30	30	33	36	39	41	47	53	44	50	56	63	70	83	90	110	125	160	185	210	245
5/16	30	30	30	30	30	33	36	39	41	47	53	48	53	59	67	75	83	90	115	130	160	185	210	245	
3/8	30	30	33	36	39	41	43	48	53	59	67	75	83	90	97	115	130	160	185	210	245	270	300	330	
7/16	30	30	33	36	39	41	44	47	52	58	64	71	80	90	97	115	130	160	185	210	245	270	300	330	
1	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330
1 1/4	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330
1 1/2	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330
1 3/4	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330
2	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330
2 1/4	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330
2 1/2	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330
2 3/4	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330
3	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330
3 1/2	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330
4	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330
4 1/2	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330
5	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330
6	30	30	33	36	39	41	44	47	51	56	63	69	77	86	96	105	120	135	160	185	210	245	270	300	330

we always deliver without charge for cases or cartage, and if we quote f.o.b. New York City, or any other place, we deliver same to that place, but do not consider that we should allow any cartage at the other end of the line.

Edwin Hunt's Sons, Chicago, Ill.—Our understanding is that the expression f.o.b. precludes charge for either cases or cartage.

Bard, Reber & Co., Reading, Pa.—We understand by it that if goods are quoted at a certain price, f.o.b. that price will include all charges, boxes and cartage, unless these certain goods are uniformly sold by all manufacturers under a rule that boxes are charged at a uniform price, and so specified either in their catalogue or the purchaser notified at the time the contract or sale is made. Without any definite information we understand f.o.b. to mean no further costs, either for boxing or transportation.

Geo. Worthington & Co., Cleveland, Ohio.—If quotation was made to us f.o.b., we should understand that there would be no charge for cases. Otherwise the quotation would be with charge for cases, which is usually done by the party making the quotation expects pay for cases.

Losey & Co., Easton, Pa.—We understand f.o.b. to refer only to cartage.

Bostwick, Braun & Co., Toledo, Ohio.—We infer that the term f.o.b. applies to cartage only, and if cases are expected free, they should be mentioned.

McCune, Lonnis & Griswold, Columbus, Ohio.—Most emphatically to cases and cartage. A quotation of 60 per cent. f.o.b. means 60 per cent. free on board cars, which would not be so were cases charged.

Washburn Mfg. Company, Chicago, Ill.—We deem it incumbent on the house which sells goods f.o.b. at any particular point to deliver such goods at that point free from all charges of carting, packing and boxing.

Hamilton & Mathews, Rochester, N. Y.—We understand that the term f.o.b. refers only to cartage.

Wells & Nellegar Company, Chicago, Ill.—We should expect goods free of boxing and carting where bought f.o.b.

A. F. Seeberger & Co., Chicago, Ill.—We understand the term f.o.b. to mean cartage only.

Janney, Semple & Co., Minneapolis, Minn.—F.o.b. means no charge for either cases or cartage.

Kent Iron and Hardware Company, Wilmington, Del.—F.o.b. we take to mean no charge for cases.

Bindley Hardware Company, Pittsburgh, Pa.—Our understanding of the term f.o.b. is no charge for cases or drayage. Should a party mean only no drayage, then the term is ambiguous, and requires an interpretation, which could be avoided by saying no charge for cartage.

Hartman Steel Company, Beaver Falls, Pa.—We understand that the term f.o.b. signifies no charge for cartage, and has no reference to boxing. Some of our customers hold otherwise, and we are, therefore, particular when quoting such goods as are boxed at the customer's expense to call attention to the charge for boxing.

Salem Wire Nail Company, Salem, Ohio.—We understand that a sale f.o.b. covers the cases, unless a charge for the cases is expressly provided for.

P. A. & S. Small, York, Pa.—We consider the term f.o.b. to mean free of charges for cases and cartage. We are aware that some understand it differently, and are glad you are making the inquiries, and trust it may tend to a definite understanding of the term.

New London Scythe Company, Scytheville, N. H.—We make no extra charge for cases.

G. & H. Barnett, Philadelphia, Pa.—As we understand the term f.o.b., it means delivery free, or without charge for carting, on board cars or boat in a given city or place. The charge for boxing is a master of arrangement between buyer and seller, some manufacturers making this charge, others not, just as terms of sale call for.

W. B. Douglas, Middletown, Conn.—We have always understood the term f.o.b., as used in the purchase of a bill of goods, to signify that the usual charges were to be made for the goods and putting them in shipping condition (that is, cases and casks to be charged), but that the delivery of the goods to the railroad station, steamboat, or f.o.b. in New York City, should cover freights from the factory and cartage in that city to the shipping point, either railroad,

vessel or steamboat. There can be no question that the commercial understanding is, that the usual charge for packages should be made, but freight charges and cartage should be free.

Enterprise Mfg. Company, Philadelphia, Pa.—Our answer to your inquiry is necessarily from the manufacturer's standpoint. Our shipments of boxed goods are of course made in original packages. It is not customary with us to charge for cases under any circumstances, and the term f.o.b. quoted by us would therefore imply that the goods were to be delivered on board vessel or at railroad depot without charge either for cases or cartage. We would not so understand it, however, from the jobber's standpoint. There it would mean free delivery at depot or on vessel, but we think the jobber would have the right to charge for cases, not original packages, unless previously understood to the contrary.

Fred. J. Meyers Mfg. Company, Covington, Ky.—Our understanding of the term f.o.b. is that goods are to be delivered free on board cars at shipping point, without charge for cases or cartage.

Goodell Company, Antrim, N. H.—We have always understood the terms f.o.b., applied to the purchase of a bill of goods, to signify that there would be no charge for cartage from factory or store to railroad, but we do not understand that it interferes with our making a charge for cases when they are necessary.

Wire Goods Company, Worcester, Mass.—We understand the term f.o.b., applied to the purchase of a bill of goods, to signify that it is free of cartage and other transportation expenses in getting it on board the cars or steamer. We do not understand that it has any reference to cases, but that it refers to cartage alone. We always charge for cases at what they are worth. If ordinary packing cases will answer, they are charged at ordinary prices, but if goods are export and must have cases lined with zinc, and strapped with iron and made air-tight, we charge in proportion to the cost, and we have never seen any other equitable way to do in the matter of cases than to charge just what they cost.

Frye, Phipps & Co., Boston, Mass.—F.o.b. means generally no case or cartage. We repeat that we understand the term f.o.b. to have no reference to cases. If we say f.o.b. here, we mean that we will see that the goods are put on board the cars or steamer without charge for that expense. If we say f.o.b. at the customer's city, we mean that we will stand the railroad freight as well to that city and there will be no charge for the transportation of the goods.

E. C. Stearns & Co., Syracuse, N. Y.—Only to cartage.

Old Colony Rivet Company, Kingston, Mass.—We do not understand that the term f.o.b. has any reference to the charge for cases.

F. O. North & Co., Boston, Mass.—Cartage only.

Barclay & Co., Machinery, cs. 2

Steel Bars: Naylor & Co., 2

Steel Bars: Naylor & Co., 2

Steel Forgings: Thos. Prosser & Son, 2

Steel Iron: F. B. Coddington & Co., 2

Rivet Bars: Naylor & Co., 2

Union Bridge Company, 2

Gustav Lundberg, 2

Steel: R. H. Wolff & Co., 2

J. Abbott & Co., 2

W. F. Wagner, 2

H. Helcher & Park, 2

THE WEEK.

Of all the ports in the United States, San Francisco leads in the proportion of American tonnage used in its foreign trade. The last report of the Bureau of Statistics for the fiscal year ending June 30, 1886, gives the proportion entered at the following ports:

American.	Foreign.
Baltimore.....	45,799
Boston.....	251,882
New Orleans.....	55,917
New York.....	947,256
Philadelphia.....	217,544
San Francisco.....	423,730

Hence San Francisco has about one and three-quarter times greater American tonnage than foreign, while all the rest have the foreign from over four to nearly twelve fold of the American. The reason of this preponderance is traceable in part to the large number of American steam vessels and the comparatively few foreign, something the reverse of what is found on the Atlantic Coast.

A new tin pan focused the rays of the hot sun on Thursday last, and the dwelling of J. M. Willard, of Boston, Mass., where the pan was set outside to dry, caught fire and was burnt to ashes.

Three of the bribed aldermen of 1884 are in Sing Sing Prison, one is insane, three have saved themselves by turning State's evidence, three are fugitives from justice in Canada, one is in Germany and two are dead. This disposes of 13 of the 22 who voted for the Broadway franchise. The remaining nine are in this city, under indictment and on bail. Of the four indicted givers Sharp, the leader, is now convicted, Foshay is dead and Kerr and Richmond await trial.

Gen. Charles J. Paine's new steel sloop Volunteer, which has been built as a possible defender of the American Cup in the approaching race with the Scotch cutter Thisle, was successfully launched on Thursday from the yard of her builders, Fusey, Jones & Co., at Wilmington, Del. The keel was laid no longer ago than May 16. The dimensions of the yacht are as follows: Length over all, 107 feet; on water line, 86 feet; extreme beam, 23 feet 2 inches. The new boat is 7 feet longer than the Mayflower over all but only 1 foot on the water line, and she is three inches less beam and has 6 inches more draft. Her keel is made of steel plates, three-quarters of an inch thick; the yacht frames are $\frac{1}{8}$ inch in thickness. They are angular in form, 3 x 2½ inches, and are placed 21 inches apart from center to center. The reverse frames are of $\frac{1}{4}$ -inch metal and measure 2½ x 2½ inches. The plates are all of steel, and are graded to suit the streaks to which they are attached, those below the water line being $\frac{1}{8}$ inch and those above $\frac{1}{4}$. All bolts are countersunk, and their ends trimmed off with a cold chisel in order to make a perfectly smooth exterior. The new boat is built upon entirely different lines from those upon which the Mayflower was constructed, and her appearance while on the stocks was entirely at variance with the orthodox ideas of the average yachtsman.

Electricity is gradually making inroads upon the old-time methods of horse transportation in our principal cities. In New York last week a very successful trial trip was made by electricity as the means of propelling surface railroad cars on Fourth avenue. The car was driven by the Julian motor with Julian storage batteries from Thirty-second street to the Grand Central depot at Forty-second street in very fast time. The car was then reversed and proceeded down town and reached the City Hall in about 22 minutes. The Brooklyn City Railroad Company have secured the consent of property owners representing \$6,000,000 worth of property for the change of their next motive power from horses to a cable road or to electricity. A practical test of an ordinary street car propelled by stored electrical energy, given by William Wharton, Jr. & Co. in Philadelphia last week, and is favorably noticed by the local editors. The experiment was demonstrated on a circular track of 1050 feet, the car at times containing as many as 35 passengers. The motive power consists of an electro-motor and 80 small cells representing the storage battery concealed beneath the seats.

The improvement of the water front in New York City, under the auspices of the Dock Board, makes slow progress, much embarrassment being experienced by the authorities in obtaining title to property held by private owners. Notwithstanding the great cost of the completed section bounded by Canal street on the south and Perry street on the north, the revenues of the city arising therefrom amount to \$250,000 in rentals, or about one-fifth of the total derived from wharves and piers. One difficulty not long since overcome was the want of money. As long as the sinking fund was reckoned a part of the municipal debt no more bonds could be issued by the Dock Department for new constructions without exceeding the limitations of the city debt prescribed by law, but the courts having removed this supposed limitation money can be obtained upon drafts authorized by the Sinking Fund Commissioners.

A railroad soon to be built through the timber region of Maine will enable passengers to breakfast in Boston and take their supper in Quebec, the time of transit being not over 10 hours. It will be in connection with the Canadian Pacific Railroad, passing

through Moose River Village, and where it is expected the Quebec Central will terminate. The timber lands will be made much more valuable.

A. A. Talmage, vice-president and general manager of the Wabash Railway, died suddenly last week from strain and overwork occasioned by great Southwestern strike 15 months ago, the causes being similar to those which terminated the career of Vice-President Hoxie. His business life commenced in a wholesale hardware store in Dey street, New York.

Northern capitalists are investing heavily in pine lands in Southern Alabama.

The Superintendent of the Philadelphia Manual Training School, in a public address last week, spoke of the institution as having reached a stage promising permanent success, and said he was receiving almost daily applications from all parts of the country asking for instructors for similar schools that are being organized. The lack of trained instructors was seriously felt in developing manual instruction.

The new Pennsylvania law providing for the semi monthly payment of wages will take effect in a few days, but it is said that the laboring men will have a struggle to enforce it. Many of the coal operators claim that the law is unconstitutional, and only a few have signified their intention of complying with it.

The bidders for constructing the new timber dry-docks authorized by the last Congress are Coffey & O'Connell, of Brooklyn, for the dry-dock at the Brooklyn Navy Yard at \$525,000, and I. F. Simpson & Co. for the two docks at Brooklyn and Norfolk at \$1,061,000. Commodore Harmony, Chief of the Bureau of Yards and Docks, will award the contracts.

The Chief Engineer of the Water Department in this city gives it as his opinion that Jerome Park will probably be the site of the new reservoir. The reservoir will have a capacity of 2,000,000,000 gallons of water, of which 700,000,000 gallons will be used daily in supplying the annexed district, and 250,000,000 in supplying New York City. It is thought that \$3,000,000 will buy the necessary 70 acres. The commissioners appointed to inspect the new aqueduct have finished their task, and the result is officially submitted. When the great work is completed they say its capacity will be 320,000,000 gallons per day, but 70,000,000 gallons of this will be taken off at the reservoir for the supply of the annexed district, leaving 250,000,000 gallons to be carried to the city proper. Of this one-half will be delivered to the "stopped" pipes above the reservoir, which are to supply the part of the city above Ninety-fifth street, and the other half will be assigned to the district below that point.

The New York and New England Railroad Company are said to have authorized improvements that will cost \$3,000,000.

The absurdity of the law prohibiting the bringing to this country of persons under contract to perform labor has been twice illustrated recently. In one case skilled workmen for silk manufacturing were brought over under an agreement to pay their passage and allow them to work it out afterward, but this brought the case under the law and they had to be sent back. Again, four zinc smelters arrived from Wales, having been engaged to work at Pulaski City, Va., under a verbal agreement, and their passage having been paid by the agent of their employers, Collector Magone was obliged to decide that they could not be landed.

The Halifax Sugar Refinery, in Nova Scotia, representing an investment of \$750,000, was sold at auction a few days ago for \$190,000. The Dominion protection laws sometimes fail to protect.

The Morris and Essex Railroad Company resist the claims of the State of New Jersey for alleged arrears of taxes, amounting to \$1,000,000, as having no foundation in law.

The pack of canned fruits in California this year is expected to be 25 to 30 per cent. more than in 1886.

The condemned schooner, Silliman, will be used by the War Department at Washington to test the power of the dynamite gun, and representatives of the several European powers will have an opportunity to witness the experiment of blowing her up.

The total arrivals of vessels at New York from foreign ports during the month of June are not quite up in point of numbers to the arrivals of June, 1886, there being a falling off in the smaller classes of sailing vessels, probably due to the fishery disputes, but of steamers there is an increase as compared with several former years. The total arrivals of all classes is 80; of steamers, 215; of ships, 124; barks, 139.

Fifty-two of the most prominent Italian business men in the city met at the office of the Italian Consul and formed themselves into an association that will be known as the Italian Chamber of Commerce.

Influenced by cheaper wheat the Minneapolis flouring mills are pressed with business, turning out 21,000 barrels of flour daily.

A partial revelation of the affairs of the mammoth "American Cotton Seed Oil Trust" was made at the annual meeting in this city last week. The financial statement

submitted shows the total amount of outstanding certificates to be \$41,706,000, which, it is claimed, represented the mills owned by the Trust and the improvements made. The earnings for the past year aggregated \$2,439,720 or about 5 per cent. on the capitalization. On this showing a yearly dividend of 4 per cent. was declared. The Trust has \$750,000 on hand and products unsold valued at \$3,378,660.

Nathaniel M'Kay, of New York, claims that the United States Inspectors of Steam Vessels have authority under the laws of Congress to prevent the overloading of foreign steamers sailing from this port.

Mayor Hewitt has appointed Morgan J. O'Brien Counsel to the Corporation in place of E. Henry Lacombe, who resigned the position to go on the bench of the United States Circuit Court for this district.

Iowa jobbers and manufacturers from all parts of the State were represented in convention at Dubuque, June 28, a special object being to see if favorable rates of transportation for freight cannot be obtained under the Interstate law.

Henry Winsor & Co., the owners of several steamship lines plying between Philadelphia and the different New England seaports, have ordered the building of a 2000-ton steamer for the coal-carrying trade between that city and Boston. The new craft will have powerful engines, in order to tow coal barges. The barge Lone Star, formerly a Morgan Line steamship, which was partially destroyed by fire in New York, has been purchased by Winsor & Co. for a similar purpose.

The National Federation of Trades Councils, in session at Chicago, adopted the following preamble to the proposed constitution: "This organization shall be known as the National Building Trades Council of the United States, and shall be composed of delegates from such building trades, federations, and organizations as recognize its jurisdiction and subscribe to its constitution. The objects of this council are to assist in the organization of the journeymen workers of the building trades; the federation of such trade organizations into building trades, councils, and central bodies in each locality of the United States; to create a bond of unity between the wage-working builders, and to aid by counsel and support all legitimate modes for the betterment of the condition of members of the building trades."

It is said that not a single vessel for freight purposes is building on the Canadian side of the lakes, while yards at Cleveland, Detroit, and Buffalo are crowded with work.

Buffalo editors think the Canadians have discovered that the natural route from the Northwest is through Buffalo to the American seaboard.

Immigration at this port is undiminished. The arrival of aliens in unusual numbers is noticed not only in New York, but is common to all the leading ports on the Atlantic seaboard, so that the immigration for the year 1887 promises an extent that has been rarely paralleled. The Superintendent at Castle Garden estimates the number of aliens who will land during the year at no less than 400,000. The arrivals at this port for June were 46,580, as compared with 35,752 for the corresponding month last year, showing an increase of 10,828. This makes a grand total since January 1st of 205,000, against 142,000 for the same time in 1886. Despite this increase, the demand for agricultural laborers was never more urgent than now. The percentage of skilled mechanical labor that comes into this port is very small, and apparently on the decline.

The Eric Canal is a vigorous competitor with the railroads in grain transportation. The shipments from Buffalo for the season thus far are 15,200,000 bushels, compared with 12,500,000 bushels last year, and by rail 12,393,000, against 9,000,000 bushels in 1886.

Taxes in Brooklyn will be higher next year. The total expenditures under the various appropriations will be \$8,036,000, an increase of more than \$1,000,000 over the present year. Allowing for an increase of \$25,000,000 in the assessed valuation of taxable property, the rate for the ensuing year will be between \$2.72 and \$2.75 per \$100 of valuation. Last year the rate was \$2.65.

An important suit relating to merchant appraisers' fees was decided by Judge Wallace, of the United States Circuit Court, last week, in the case of Iselin, Neeser & Co., of this city, against the Collector of the Port, to recover a penalty for exacting from the plaintiff a fee to cover the compensation of a merchant appraiser on reappraisal. The case was appealed by the Government from the United States District Court to the Circuit Court, and the decision of the lower Court in favor of the importing firm was reversed, Judge Wallace holding that although such an action is illegal the merchant has no remedy where a certificate of probable cause is granted. This decision, in effect, covers over 80 similar pending suits against collectors in this district to recover penalties aggregating about \$500,000.

The pool of wall paper manufacturers, formed seven years ago, has ended in a failure to renew the agreement. There are about 35 wall paper manufactories in the United States, situated mainly in New York, Philadelphia, Brooklyn and Buffalo. Of these, 16 were regularly in the pool and six conformed to its requirements in every particular except the pooling of profits. Strenuous efforts have been made by some of the pool houses to renew the pool agreement for another period, but some of the very largest houses determined that as the pool could only be of benefit to them unless joined by substantially all the manufacturers, they would not renew their agreement unless all the important outsiders came in, and this the latter refused to do. Now, it is every man for himself. A member of the late pool gives it as his opinion that cheap goods would be run upon for a season and would be sold at cost of manufacture, or very little more, but goods of better quality would not be any cheaper. All manufacturers would deal direct with the retailer and many of the jobbers would cease carrying stocks. Whether the pool would ever be re-established would depend upon the developments of the ensuing year.

The Chinese census of 1875 gave the population of the empire at 435,000,000. Since that time Tongquin has been lost, with several million people, and Kashgaria has been reconquered. Among no people with any degree of civilization is the birth rate so high as in China, and although the death rate in the densely crowded districts is very great, there is every reason to presume there are now 450,000,000 people in China. These figures represent more than one third of the population of the globe. It is a greater population than that of all Europe, and three times the number of people on the Western continent. Even at these enormous figures the average number of people to the square mile for the whole empire—85—is not so high as in some parts of the United States.

It is reported, on apparently good authority, that a close alliance has been formed between the Jersey Central, in which Mr Corbin is actively interested, and the Lehigh Valley. By this alliance the Lehigh Valley is to send all its freight to Jersey City over the Jersey Central, and the latter is to have access to the magnificent terminus of the Lehigh Valley in Buffalo. The latter is also to unite with the Jersey Central in making improvements upon a large scale to the terminals of Jersey Central at Communipaw.

Many inventions are made by workmen in the course of their daily duties, using the time and material of their employers in the usual course of experiments necessary to the application of a new idea. When afterward the invention turns out to be a thing of value, or a dispute arises between the inventor and his employer, the patent frequently becomes the subject of litigation which is very difficult to determine with anything approaching exact justice. The Supreme Court of Wisconsin having a case of this kind before it decided in favor of the workman. It held as a guiding principle that it is the conception in the perfected machine, not the materials, workmanship or skill employed in working it out that constitutes the invention, and hence that the workman who suggested the idea is the lawful owner of the invention.

The way Englishmen are crowding themselves into various lines of enterprise in Mexico prompts a correspondent at the Mexican capital to say: "The English are capturing the banking business, or such part of it as the national bank leaves open to them, and the result will be that the English will gain a grip on this country that the United States cannot easily shake off. Had our Congress put through the reciprocity treaty two or three years ago American banks would have come in to aid the development of American trade, but no American here has any belief that our Congress will see the worth of this Mexican business till every other nation has seized on all that can be obtained. Fortunately we have the two great railways, the Central and the National, but so sound a journal as the London *Economist*, just at hand, says that these corporations are rapidly becoming more English than American. It seems odd that a country like the United States, which used to be a pushing, aggressive, commercial nation, is so easily beaten nowadays in foreign trade extension."

The coopers of New York City have decided to submit to their employers a new scale of wages, to commence September 15, 1887. Working hours are to be ten per day and nine on Saturday; no non-union men to be employed; no man to be discharged except for negligence or drunkenness; reasons for discharge to be stated; wages, \$3 per day; infirm men's wages to be decided by the union; pay day to be Saturdays; all piece work to be abolished; only one apprentice to be allowed to every 10 coopers; apprentices to be not less than 10 nor more than 18 years of age to serve for three years at wages, \$6, \$9 and \$12 weekly. These terms are to be accepted by August 15.

The anniversary of the Confederation of the British Provinces in Canada was made the occasion last week of an address by Mr. Wiman, of New York, before an assemblage at Dufferin Lake, wherein he depicted in glowing terms the advantages possible to be realized through free commercial intercourse between the Dominion and the United States, and this without disturbing the form of government in the Dominion, or lessening the fealty of British subjects to the Crown. The native deposits of copper in Canada, he claimed, were superior to any other in the world. In Newfoundland there are 5000 square miles of copper-bearing territory, and in no small portion of it nickel exists in large quantities. The natural market of Canada, the speaker claimed, is the United States.

Trade Report.

NEW YORK.

The week has been so much shortened by the holidays that very few transactions have taken place, and prices, with few exceptions, have remained stationary.

American Pig.—There is practically nothing to report, the features which have characterized the market for so long a time still controlling it. Standard brands remain \$21 @ \$21.50 for No. 1 Foundry, \$19.50 @ \$20.50 for No. 2 Foundry, and \$17.50 @ \$18.25 for Gray Forge, with outside brands available at 50¢ @ \$1 loss.

Scotch Pig.—The market is quiet, but is fairly firm, chiefly on account of higher freights. We quote: Coltness, \$22 @ \$22.50; Glengarnock, \$20.50 @ \$20.75; Shotts, \$21.50 @ \$21.75; Gartsherrie, \$21 @ \$21.25; Carnbroe, \$20.75 @ \$21; Summerlee, \$21.50 @ \$21.75; Dalmellington, \$20.25 @ \$20.75, and Eglinton, \$19.75 @ \$20.

Spiegeleisen.—Nothing has been done, and values remain at \$27 @ \$27.50 for 20%.
Bessemer Pig.—We do not hear of any business either in Domestic or in Foreign.

Bar Iron.—The market has been quiet. We quote Common, 1.8¢ @ 1.9¢; Medium, 1.9¢ @ 1.95¢, and Refined, 1.05¢ @ 2.25¢, on dock.

Structural Iron.—We quote for large quantities: Angles, 2.25¢ @ 2.40¢; Tees, 2.70¢ @ 2.75¢, and Channels and Beams, 3.30¢, base on dock.

Plates.—We quote for round lots of Common or Tank, 2.25¢ @ 2.50¢; Refined, 2.50¢ @ 2.60¢; Shell, 2.6¢ @ 2.8¢; and Flange, 3.5¢ @ 3.8¢; Extra Flange, 4.25¢ @ 4.50¢. For Steel Plates quotations are as follows: Tank, 2.6¢ @ 3¢; Ship, 2.9¢ @ 3¢; Shell, 2.9¢ @ 3.15¢; Flange, 3.15¢ @ 3.50¢, and Firebox, 3.75¢ @ 4.50¢, on dock.

Steel Rails.—The only transactions reported is the sale of 8000 tons by an Eastern mill. We continue to quote \$38 @ \$39.50 at Eastern mill, according to time of delivery, locality, &c.

Blooms and Billets.—There has been some inquiry both from the West and from Eastern Pennsylvania. The foreign Steel works appear to be so busy with orders that they show little disposition to quote low prices, and importers now ask \$30.50 @ \$31 for Billets.

Wire Rods.—While the discussion on the duty on Wire Rods is going on, little or no business is being transacted. We quote nominally \$38.25 @ \$38.75.

Old Rails.—The market is irregular, and is difficult to review, opinions varying widely. There are a number of orders in the market from Western consumers, who are now sure of running along without labor complications. As yet none of these orders have been placed, the only transaction during the past five days being the purchase on speculation of a 500-ton lot of Doubles, afloat to this port. Sellers ask \$23 @ \$23.50 for Tees, and \$24 @ \$25 for Double Heads, prices which buyers are apparently not yet ready to pay. The local-supply in store is held by a comparatively small number of dealers, and sellers abroad, for shipment, are asking higher prices. Consumption is not likely to be very heavy during the current month, when many of the mills close down for weeks for repairs, and some of the largest purchasers have stock for months to come. On the other hand, the quantity available from American roads has been unexpectedly small thus far, judging from the sales in the open market East and West. It must be taken into account, however, that a good deal of the domestic material, notably in the West, is taken over in part payment for new Steel Rails.

Railroad Fastenings.—Spikes are quoted 2.40¢ @ 2.50¢ net; Angle Fish Bars, 2.1¢ @ 2.25¢; Steel Angle Bars, \$2.20 @ \$2.30; Bolts and Nuts 3¢ @ 3.20¢, and Bolts and Hexagon Nuts 3.2¢ @ 3.30¢.

Metal Market.

Copper.—The Copper market in this city has shown extreme strength during the past week, buyers having come forward with liberal bids, but were not able to find holders disposed to part with their holdings, even at the enhanced prices. From 100,000 to 200,000 lb Lake were picked up for July delivery at from 10.10¢ to 10.12½¢, but since then 10.15¢ has been freely bid and refused for spot and July deliveries; 10.20¢ is bid for August, 10.30¢ for September, 10.35¢ for October and 10.40¢ for November and December. As buyers raise their bids sellers retire, and it looks as if spot Copper would soon reach 10½¢, when, as usual, the crowd will rush in and bring it back to its legitimate value. Casting Copper is also firmer, and the various brands are held firmly at 9½¢ @ 9½¢. Best Selected is cabled £45. 5¢ from London, while Chile Bar stood £40 July 1, £39. 5¢ July 5 and this morning £39. 12. 6¢. Export of Pyrites from Spain during the first four months, 266,679 tons, against 223,555 in 1886 and 278,152 in 1885; of Precipitate, 9823, against 8125 and 9302. As much as 10½¢ has been paid for Lake Copper on the spot in this market yesterday, we are assured.

Tin.—There has been very little doing in this market, owing to the holidays. Spot Tin remains scarce, and is not obtainable below 23½¢, even higher prices than that having been paid on the quiet, thus clearing late arrivals. For future delivery our market seems to be guided by London, where prices have been improving steadily from £102. 5¢ to £102. 17. 6¢. We quote: July delivery, 22.80¢ @ 22.85¢; August, 22.75¢ @ 22.80¢, and September and October, 22.60¢ @ 22.65¢. Shipments from London are offered in moderate quantities at 22.80¢, without for the moment attracting buyers.

Tin Plates.—No new features have arisen; the trade has been the reverse of active, but prices remain as firm as heretofore at following quotations per box, large lines: Siemens-Martin Steel, Charcoal Finish, \$4.75 @ \$5; ditto Coke Finish, \$4.65 @ \$4.70; Charcoal Terne, \$4.30 @ \$4.50, and Coke Tin, \$4.37¢ @ \$4.50. Liverpool cables Coke 13/6.

Lead.—Sales for the week have not exceeded 300 tons at 4.50¢ down to 4.45¢ Common Domestic; but not over 4.40¢ could probably be got at the close, the market winding up listless at 4.40¢ @ 4.45¢ nominally, and Refined, 4.55¢ @ 4.60¢, also nominally. Chicago and St. Louis are 4.35¢, with Common. Export of Pig Lead from Spain during the first four months, 42,972 tons, against 38,187 in 1886, and 42,138 in 1885. There has been a break in Soft Spanish Lead in the London market to £11. 17. 6¢, while English Pig is cabled £12. 2/6 this morning.

Spelter and Zinc.—Nothing of special interest has transpired in Common Domestic Spelter since our last report. A moderate demand continues to exist, and is currently filled at 4.52½¢ @ 4.55¢ as to brand, while Silesian may be quoted 4.80¢, remaining £14.12/6 in London. Export of Calamine from Spain during the first four months, 8287 tons, against 10,002 in 1886, and 15,833 in 1885.

Antimony.—Without any change in London, which continues at £34 with Hallett, we have remained moderately active here at 8½¢ @ 8½¢ the latter, and 9½¢ @ 9½¢ Cookson.

New York Metal Exchange.

The following sales are reported:

THURSDAY, June 30.

90 tons Tin, July.....	22.80¢
10 tons Tin, spot.....	22.15¢
10 tons Tin, July.....	22.75¢
25 tons Tin, prompt shipment.....	22.67½¢
20 tons Tin, October.....	22.55¢
10 tons Tin, spot.....	23.15¢
25,000 lb Copper, spot.....	10.05¢
25,000 lb Copper, July.....	10.10¢

FRIDAY, July 1.

10 tons Tin, August.....	22.90¢
50,000 lb Lake Copper.....	10.10¢

Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, July 5, 1887.

One half the year has passed without bringing with it the improvement in business that was very generally expected. But it is by no means certain that these hopes will not be realized before the next six months have passed away. The conditions are favorable, but recent events are admonitory not to be too sanguine in making predictions. Indications, however, as we have said, are of a most encouraging character. Large consumers of Iron are almost all busy, and those that are not in that condition are likely to fill up at any moment. Railway interests are the largest consumers, embracing, as they do, Rail manufacturers, Locomotive and Car builders, Machine Tools, Bridge building, &c. These, almost without exception, are crowded with orders, and aggregate a larger amount of work under contract than was ever known before. Ship-building is moderately active, but promises to be much more so a few weeks later on. Government contracts alone will make a great deal of work, but in addition to that there is every prospect of a great deal of work from other sources. Pipe manufacturers were among the largest consumers of Iron during the past 12 months, and are likely to be so for a long time to come. They have bought very little, however, during the past 10 or 12 weeks, and the loss of that demand has materially affected some of the mills. But there is every reason to believe that there will be a renewal of the demand soon. Pipe makers bought too heavily in the spring, and they are now working up their stocks. The price of Pipe, they say, does not warrant the price paid for Skelp, so that they have not been in the market recently. The demand for Pipe keeps up all the same, however, so that makers cannot remain out of the market much longer. The fact of the Reading Iron Works closing their large establishment indicates that that management fail to see any prospect for a reasonable margin of profit, although they inform us that they could fill up for months, providing they would accept prices now generally current. Still, if there is a genuine demand for Pipe, it is hard to believe that it will be supplied at a loss. The fair inference would be that a renewed demand for Skelp will advance prices of that article, and, to the same or a greater extent, advance Pipe also. Prices are undoubtedly low; the enormous increase in productive capacity has, in fact, made everything low, but admitting that it is not likely that business will continue to be done at a loss. On the whole, therefore, the outlook for the balance of the year may

be taken to indicate a gradual increase in the volume of business, and, in all probability, a corresponding hardening in prices.

Pig Iron.—There has not been any great fluctuation in the price of Pig Iron, \$1 @ \$1.50 per ton being the extreme range. The change of sentiment, however, would represent much higher figures. When Iron was advancing some people predicted a \$5 or \$10 rise, and when the reaction came a serious decline was looked for with almost equal confidence. But, as a matter of fact, prices refused to go down almost as stubbornly as they refused to go up, and the second half of the year finds quotations of Foundry Iron at precisely the same figures as they were six months ago. Mill Irons are a trifle lower, say 50¢ per ton, but as regards large consumers they are probably just the same; in fact, contracts for the last half of the year are being renewed on the same basis as made for the first half. The advances, therefore, were simply on small lots, the highest figures having been made in February. The output of Pig Iron (until the Coke strike) was the largest in the history of the country, and to this must doubtless be attributed the entire absence of "boom." Stocks are probably not much, if any, greater than they were in January, so that the position may be considered a very healthy one. As to the outlook, it is not easy to make predictions, although the general sentiment, and for that matter, all the conditions appear to favor somewhat better prices. The demand, as we have tried to show, is likely to be very large, which is one reason for firm prices. Another reason is, that cost of production is much higher than it was, so that only a few can make Iron at present prices, consequently any increase in demand can only be met by paying higher figures. There may of course be some accumulation during the next three or four weeks, and some of the weaker companies may try to realize at best prices obtainable, but the chances are that to-day's quotations will be lower than the average of the next six months. The following are the extreme quotations during each month to date:

	January.	February.	March.	April.	May.
No. 1 Foundry, at tide.....	\$21.00 @ \$22.00				
No. 2 Foundry, at tide.....	19.50 @ \$20.50				
Gray Forge, at tide.....	15.00 @ 19.00				
		21.00 @ 23.00			
No. 1 Foundry, at tide.....	19.50 @ 20.50				
No. 2 Foundry, at tide.....	18.50 @ 19.50				
Gray Forge, at tide.....	19.00 @ 19.50				
		20.50 @ 21.50			
No. 1 Foundry, at tide.....	19.00 @ 19.50				
No. 2 Foundry, at tide.....	18.00 @ 18.50				
Gray Forge, at tide.....	17.00 @ 17.50				
		20.50 @ 22.00			
No. 1 Foundry, at tide.....	19.00 @ 20.50				
No. 2 Foundry, at tide.....	18.00 @ 18.50				
Gray Forge, at tide.....	17.00 @ 17.50				

June.

No. 1 Foundry, at tide.....

No. 2 Foundry, at tide.....

Gray Forge, at tide.....

17.50 @ 18.00

18.00 @ 18.50

17.50 @ 18.00

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July 7, 1887.

THE IRON AGE.

33

Trade Report.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth avenue, Pittsburgh, Pa., July 5, 1887.

The most important item we have to note is the settlement of the wage scale for the year beginning July 1. Concessions were made on both sides; the advance of 10 1/2 cent demanded by the Amalgamated Association was granted, but a number of extras also asked for were not allowed. However, it does not follow because the scale has been adjusted that all the mills will continue to run. Some mill-owners contend that the present condition of the market for Finished Iron does not warrant the enhanced cost of labor. It is well known that some firms are pretty well supplied with orders for specialties, and that it was their intention to sign the scale. This was evident from their non attendance at the meeting of the manufacturers in regard thereto, and no doubt brought the matter to a close sooner than it would otherwise have been. As it now stands those mills having business will continue in operation, while others not so situated will remain idle for a time at least. The Coke strike still continues. The Pig Iron furnacemen are still clamoring for cheaper Coke, but Coke operators say they cannot reduce the price of Coke and pay an advance for labor. The fact that the ovens owned and controlled by Carnegie, Phipps Co. are paying the advance makes the strikers all the more determined. The Coke strike, therefore, has an important bearing upon the iron trade.

Pig Iron.—Though the wage scale is settled, many mills will remain idle for a time, which will decrease consumption. In regard to prices there has been no notable change since our last report. Consumers are bearish, alleging that Pig Iron is higher relatively than the products, while producers point to the light supply and idle furnaces as indicating that there is more likely to be an advance than decline. The furnaces here and in the valleys, with few exceptions, are either out of blast or banked up, and the few in operation have no iron to sell, having contracts to absorb their entire production. Thus, while the market is strong in one respect it is weak in another. If the situation should continue for a few weeks more a stronger market may be looked for, as the supply, especially of desirable qualities, is steadily being reduced, but in the event of the Coke strike being brought to a close and the price of Coke reduced, a number of furnaces would at once be started up and the result would be entirely different. As will be seen, therefore, the near future of the market hinges upon a number of contingencies, all of which have an important bearing, and there is a good deal of uncertainty connected therewith. Quotations may be fairly given as follows:

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts., Chattanooga, Tenn., July 4, 1887.

Extensive and steady rains at intervals throughout the entire South have advanced the crop prospects to an unusual degree, and farmers and planters are in good spirits. The results are of course beneficial to all lines of trade, and merchants are beginning to feel the effects. Other than this there is nothing new. The location of new manufacturing enterprises continues. Of late in our immediate vicinity a new Tool factory, also a large concern for the manufacture of Coffins and Castings, have been located, and the buildings are well under way. These will employ about 150 men each. There is no lack of orders, regard to the reputation of their product.

Manufactured Iron.—The signing of the wage scale by the manufacturers will no doubt cause buyers to breathe easier, as in the event of a shut down, higher prices would probably have been obtained. However, as already intimated, some of the mills now stopped for stock-taking and repairs will not be started up until the situation improves. It is contended by mill-owners that the present cost of the raw material is higher relatively than the products, and therefore that there is little or no margin for profit in present prices. The general Merchant Iron trade is light, but the indications are that it will improve before the close of the month. The Skelp Iron trade is also disappointing, but it, too, will probably improve before long, although it is not likely that the expectations entertained by the more sanguine are likely to be realized. There is a continued good degree of activity as regards Structural and Bridge Iron; those mills making a specialty of these have about all they can do.

Nails.—The market is firmer, and so far as we can learn there are now but few, if any, manufacturers here or west of here willing to sell below \$2.60 per ton, 2% off for cash. Private advices report that some of the Wheeling manufacturers who were down to \$1.90, and even \$1.85, are now demanding \$2.60 and refusing to sell for less. The Pittsburgh nailers have agreed to accept the same price for cutting paid for same kind of work at Wheeling. As jobbers have been buying very sparingly for some time past, it is evident that they are low in stock, and will soon have to replenish, and an improved trade is looked for before long. While the demand for Wire Nails is improving, they are not supplanting the Cut Nails as rapidly

as a good many people imagine. The next monthly meeting of the Western Nail Association takes place to-morrow week.

Wrought-Iron Pipe.—There has been no important change in the situation during the past week; the market continues in an unsettled and unsatisfactory condition. There is a fair degree of activity, but prices continue unsettled and irregular. As has been the case for some time past, each firm is making its own price, hence there is no uniformity, and herein is one of the most discouraging features of the business at the present time, and it is impossible to quote prices with any degree of accuracy in consequence. While the last regular meeting adjourned over until September, a special meeting can be called at any time.

Old Rails.—The market is much firmer, and prices have further advanced. We now quote Foreign Tees at \$25.75 @ \$26, and Double Heads at \$26.75 @ \$27. Sale of 1500 tons for July and August delivery reported at \$26.85.

Steel Rails.—Heavy sections are still quoted at \$39 @ \$40, cash, free on cars at Pittsburgh. Mills here, as elsewhere, are pretty well sold ahead, and it is difficult to place an order for near-by delivery.

Billets, &c.—We are advised of a sale of 1000 tons Bessemer Billets, at \$31, 60 days, but it is doubtful whether an order for another could be placed at that figure, as the market is much firmer. Foreign Billets cannot be laid down in Pittsburgh much, if any, under \$32 @ \$32.50, cash. No sales of Nail Slabs reported and there does not appear to be much inquiry, but they, too, are firmer. Last sales of Rail Ends reported were at \$22 @ \$22.50, for American; Bloom Ends quoted, in absence of sales, \$21 @ \$21.50.

Railway Track Supplies.—Spikes have been reduced from 2.75¢ to 2.60¢, 30 days, delivered. Splice Bars remain unchanged at 2.10¢ @ 2.20¢, and Track Bolts, 3.30¢ with Square, and 3.40¢ with Hexagon Nuts. The indications are favorable for a good trade the last half of the year, and the fact that Old Rails have stiffened will steady up the market for Spikes.

Old Material.—There is no improvement in demand, but it is likely that there will be before the close of the present month. Prices remain unchanged. No. 1 Wrought Scrap, \$20.50 @ \$21, net ton; Wrought Turnings, \$15.50 @ \$16; Cast Axles, \$26; Cast Borings, \$13, gross; Old Car-Wheels, nominal at \$20 @ \$20.50, gross.

Mr. John Q. Everson having sold to Robert R. Hammond all his interest in, and withdrawn from, the firm of Everson, Hammond & Co., Limited, the present style of the firm is W. J. Hammond & Sons, Limited. The new firm will continue to operate the Pennsylvania Iron and Steel Works in all its departments, making a specialty of the lighter gauges of Sheet Iron and Sheet Steel.

St. Louis.

St. Louis, July 4, 1887.

Pig Iron.—Some large orders have been placed during the past week at prices a trifle less than those quoted 10 days ago, and commission men report inquiry very heavy for standard foundry grades, especially for Southern Coke Iron, which is the basis of most mixtures.

Southern Coke No. 2 Foundry.—19.00 @ 20.00
No. 1 Mill.....18.00 @ 18.50
No. 2 Mill.....17.00 @ 17.50
Bessemer.....22.00 @ 23.00

Bar Wire.—Not very active, selling at about \$3.50 for Painted and \$4.25 for Galvanized; but buyers would not have much trouble in placing large orders at, say, \$3.25, Painted, and \$4.00 for Galvanized. Some sales are reported to have been made at the latter figures.

Steel Nails.—The market is good, and buyers seem to realize that Nails are cheap. Brokers and dealers say that sales are much easier to make at the advance than they were at the old figures. Wheeling Steel Nails are offered as low as \$2.27 1/2, St. Louis, and considerable selling through brokers.

Old Rails.—There is considerable inquiry for eastern shipment, especially for fall delivery, but offers hardly meet buyers' views. Prices are at East St. Louis, \$22.50 @ \$22.75.

Old Wheels.—There is considerable demand but none offering. Prices are nominally \$20.50 @ \$21.00.

Scrap.—Wrought Scrap is dull, considerably coming in and the demand is limited, prices about 65¢ @ 70¢ per 100 lb. Cast Scrap is also weak, owing partly to the fact that most of the cable contract is filled or is contracted for. Prices 65¢ @ 85¢ per 100 lb, according to quality.

Cincinnati.

CINCINNATI, July 4, 1887.

A firmer and more confident tone has prevailed in the Pig-Iron market during the past week, with the tendency toward higher prices, although as yet no advance of importance has been realized. The settlement of the Iron workers' differences without the last resort—of a strike—has acted as a sustaining influence, and has been the cause of renewed buying by rolling mills and agricultural works. The Coke strike is not yet settled, and as a natural sequence there is a gradual but steady decrease in stocks, consumption continuing quite heavy. There has been a good run of orders for small lots of mill grades, and some round lots, too, have been sold for early fall delivery. Foundry grades have been comparatively quiet. It is difficult to obtain Southern Coke Iron at current rates, but Northern Coke Iron has been obtainable and a number of contracts placed. There have been moderate transactions in Lake Superior Iron at previous prices. The demand for Charcoal Iron has increased materially. Western Malleable works are reported to have placed contracts for their entire season's supply, and agricultural works are preparing to follow this example, being stimulated by the rapid reduction of stocks. The affairs of E. L. Harper & Co. have cut but a small figure in the market. Considerable difficulty has been experienced to obtain a suitable trustee who would accept the responsibility and labor involved in the trusteeship of their tangled affairs. The current cash price for Pig Iron, f.o.b. cars at Cincinnati, are as follows:

Charcoal Foundry.

Hanging Rock, No. 1.....\$23.00 @ \$24.00
Hanging Rock, No. 2.....21.00 @ 22.50
Southern No. 1.....21.00 @ 22.00
Southern No. 2.....20.00 @ 21.00

Coal and Coke Foundry.

Ohio Soft Stonecoal, No. 1.....20.00 @ 20.50
Ohio Soft Stonecoal, No. 2.....19.00 @ 19.50
Southern Coke, No. 1.....20.00 @ 20.50
Southern Coke, No. 2.....19.50 @ 20.00
Ohio and West Pennsylvania Coke, No. 1.....21.00 @ 22.00
Ohio and West Pennsylvania Coke, No. 2.....20.00 @ 21.00

Forge.

Strong Neutral Coke.....18.00 @ 18.50
Mottled.....17.00 @ 17.50
Southern Coke.....18.00 @ 19.00

Car-Wheel and Malleable Irons.

Southern Car-Wheel.....25.00 @ 27.00
Hanging Rock, Cold Blast.....26.00 @ 27.00
Hanging Rock, Warm Blast.....24.00 @ 25.00
Lake Superior Malleable.....24.00 @ 25.00

Old Rails and Wheels.—There has been a more active demand for Old Rails, and a better inquiry for Wheels, but it has led to some urgent inquiries from the East, with some sales. Three round lots of a standard brand of No. 2 have been sold to go to Boston at \$17 net cash, at the furnace, and two lots to New York of No. 2 that netted the Furnace \$16.85. This is a very good indication that the scarcity is not local. While this may be merely temporary, yet some of our largest producers are of the opinion that the market is on the eve of a firm advance, especially in standard brands of Foundry Irons. While the Eastern market is just now the most favorable point to which our producers can ship, yet the inquiries that have been made seem to come from all over the North, and do not appear to be confined to any one particular point. The demand from the Southern furnaces is decidedly on the increase. This is the result of a number of new furnaces being established and the enlargement of many of the old ones, and the day cannot be far distant when the demand from the Southern furnaces will be an important item for the furnaces to turn their attention to. In fact, at the present time there are some two or three who are disposing of most of their products in this direction.

Cleveland.

CLEVELAND, July 4, 1887.

Iron Ore.—Prices for Iron Ore continue very firm owing to the unusually high vessel rates and to the fact that fully three-fourths of the contemplated output of the mines was sold early in the season. The Ore handlers on the docks have returned to work and shipments to the furnaces have increased in consequence. Ore dealers and furnacemen, too, estimate that the strike will have the

effect of considerably reducing the total receipts for the year. Sales for the past week have been limited, the heaviest business reported by any of the local companies not exceeding 5000 tons. A limited amount of Ore has been sold at the mines, but mainly for Chicago delivery. Few orders are expected from the Lake Erie distributing points while vessel rates remain so exorbitantly high. Charters have been made during the past week at \$1.65 from Escanaba—a rate at which vessels can well afford to bring Ore from Ashland. Furnacemen do not seem greatly disturbed by the situation.

St. Louis.—St. Louis, July 4, 1887.
Pig Iron.—Some large orders have been placed during the past week at prices a trifle less than those quoted 10 days ago, and commission men report inquiry very heavy for standard foundry grades, especially for Southern Coke Iron, which is the basis of most mixtures.

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No. 1 Mill.....18.00 @ 18.50
No. 2 Mill.....17.00 @ 17.50
Bessemer.....22.00 @ 23.00

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Old Rails.—There is considerable inquiry for eastern shipment, especially for fall delivery, but offers hardly meet buyers' views. Prices are at East St. Louis, \$22.50 @ \$22.75.

Old Wheels.—There is considerable demand but none offering. Prices are nominally \$20.50 @ \$21.00.

Scrap.—Wrought Scrap is dull, considerably coming in and the demand is limited, prices about 65¢ @ 70¢ per 100 lb. Cast Scrap is also weak, owing partly to the fact that most of the cable contract is filled or is contracted for. Prices 65¢ @ 85¢ per 100 lb, according to quality.

Old Rails.—There is a most active demand for Bessemer Irons. The better buying movement in all grades of Pig Iron which the dealers have anticipated for several weeks seems to have come in earnest. Sales for the past six days show a large increase over the business of the preceding week. Buyers who refused certain Irons at the ruling price two weeks ago are now in the market ready to buy. The light production and liberal consumption of Iron seems likely to still further improve the condition of the market. The following are f.o.b. cash prices in this market:

No. 1 to 6 Lake Superior charcoal.....\$24.00
No. 1 strong Foundry, Bessemer quality.....21.35 @ 21.85
No. 2 strong Foundry, Bessemer quality.....20.85 @ 21.35
No. 1 American Scotch, Bessemer quality.....21.35 @ 21.85
No. 2 American Scotch, Bessemer quality.....20.85 @ 21.35
No. 1 Soft Silvery, Bessemer quality.....20.00 @ 21.00

Mahoning and Shenango Valley Neutral Mill Irons.—@ 18.85
Mahoning and Shenango Valley Red Short Mills, @ ton.....@ 19.85

Scrap.—The Scrap Iron market seems almost perfectly lifeless. Old Rails are quoted nominally at \$24, but have sold for \$23.50. Old Wheels remain at \$21, with only a limited business reported.

Nails.—Iron Nails seem to have struck bed rock at \$2 1/2 keg, and Steel Nails refuse to go below \$2.10.

Louisville.—Louisville, Ky., July 4, 1887.

The demand for Pig Iron during the past week has been better than for two weeks previous, and a greater number of sales—mostly for Foundry grades—have been booked. One feature of the market that has been quite noticeable has been that in most cases offers made by buyers at close figures have been declined, and buyers have had to come to the views of sellers before transactions have been closed. In some cases transactions have been closed by a division of the sales and circumstances attending show a firm tendency. There are still some lots of iron on the market owned by speculators, or by consumers purchased in excess of their wants, and these lots, as a general thing, can be bought at our inside quotations. There are many grades, however, that are not included in these lots, and these grades, when sold, must come from furnaces. The furnaces continue to be generally largely sold ahead and are asking outside figures. Sales have been made in consequence for furnace account for brands and grades of Iron needed for buyer's mixture at 50¢ @ \$1 1/2 ton over relative prices asked for the speculative lots. This and the increased demand have induced some of the speculative lots to be withdrawn, and any considerable demand now would undoubtedly advance prices all along the line. The continued activity in railroad building and the scarcity of some brands and grades are giving renewed tone to the market, the monthly report of the Western Pig-Iron Association showing a decrease in the stocks in first hands from May 1 to June 1, and is the only instance of this kind for several years, the reverse having been the case. Altogether, the indications are for a better market and better prices. Another instance of strength is the fact that these favorable indications come immediately after the excitement in Chicago, Cincinnati and New York, attendant upon the collapse in wheat, coffee and stocks. We quote for cash in round lots as below:

Southern Coke, No. 1 Foundry......\$19.50 @ \$21.00
".....18.50 @ 19.00
".....18.00 @ 18.50

Hanging Rock Coke, No. 1 Foundry......19.00 @ 20.00

Southern Charcoal, No. 1 Foundry......21.00 @ 22.00

Silver Gray, different grades......17.00 @ 18.50

Southern Coke, No. 1 Mill, Neutral......17.00 @ 18.50

".....17.00 @ 17.50

".....17.00 @ 17.50

Charcoal Coke, No. 1 Mill......18.50 @ 19.50

White and Mottled, different grades......16.00 @ 17.00

Southern Car-Wheel, standard brands......25.00 @ 26.00

Southern Car-Wheel, other brands......22.00 @ 23.00

Hanging Rock, Cold Blast......25.00 @ 26.00

Hanging Rock, Warm Blast......22.00 @ 23.00

W. B. BELKNAP & CO., Louisville.—W. B. Belknap & Co., Louisville, report as follows, under date of July 4, 1887:

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Hardware Dealers Take Notice,

and buy where you can get the best quality at the lowest price, thereby not only satisfying your customers, but also putting money in your own pocket.

Our Eureka Patent Flexible Back Saws, the teeth of which are hard, the back being soft, thereby preventing them from breaking in two, have been greatly improved and are giving the best satisfaction. Our Crescent brand of Hack Saws are hardened all through with uniform temper, and are the best Hack Saws so tempered.

We are now preparing to supply the wants of the trade according to their preference. Hardware Dealers run no risk by buying from us either our Eureka or Crescent brand of Hack Saws on our recommendation, as we give them the option of returning the first lot to us at our own expense any time within three months from date of invoice. Correspondence solicited.

Henry G. Thompson & Sons, Cor. Elm and State St., New Haven, Conn.,

— MANUFACTURERS —

Flexible Back Band Saws for Cutting Metals,
Hack, Meat and Kitchen Saws and Frames.

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American Tin Zinc Company, LIMITED,

85 Beaver St., New York,

MANUFACTURERS OF

TIN ZINC,

W. J. WILDER'S PATENT, March 10th, 1885.

A New Metal especially adapted for Roofing, Lining Refrigerators, the Manufacture of Britannia Ware and all Articles where Spun Metals are Required. An excellent Substitute for Tin Copper and White Metals.

LANE'S MEASURING FAUCET.

Price, \$3.00.

or Light or Heavy Molasses, Oils,
Varnishes or other Fluids.

We warrant these Faucets to be as represented, measuring correctly and working more easily in heavy and light molasses than any other in the market. No grocer can afford to be without them, for they save time, and "time is money." They insure perfect cleanliness, requiring no tin measures or funnel to collect and draw off. They do not drip. They prevent all chance of moisture or oil fluid can pass except when the crank is turned. They are the embodiment of simplicity, and consequently they are always in order. They work easily in the heaviest molasses. They are warranted to measure correctly, according to U. S. Standard.

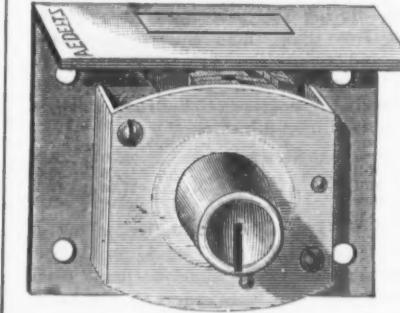
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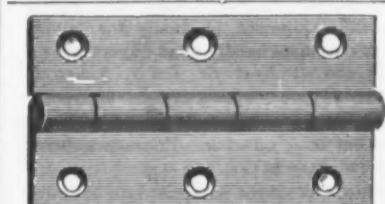
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W. & J. TIEBOUT,

MANUFACTURERS OF
BRASS, GALVANIZED & SHIP CHANDLERY

HARDWARE.

Nos. 16 & 18 Chambers Street,
NEW YORK.

ALWAYS GIVES THE
UTMOST SATISFACTION.

Main Belting Co.,

Manufacturers of

THE LEVIATHAN

COTTON

BELTING.

Unsurpassed for
Strength, Durability and
Cheapness.

Made to any Length,
Width and Strength.

Main Driving Belts.

Guaranteed to Run
straight, Even Through-
out.

No Cross Joints. Un-
affected by Damp.
Gives well to the Pulley.
Has no equal. In fact,
is THE BELT.

MAIN BELTING

COMPANY,

S. W. cor. Ninth and Reed
Sts., Philadelphia.

Also

248 East Randolph St., CHICAGO.

The "Superior Wringer."



Fully Warranted. Has Patent Adhesive Rolls,
Best Steel Springs, Malleable Iron Crank.

Send for fully Illustrated Catalogue and Price-
List of thirty different styles and sizes of Wringers.

BAILEY WRINGING MACHINE CO.

WOONSOCKET, R. I.

Non-Corrosive

PRIMING and FINISHING PAINT

For Engines, Machinery, &c.

This paint being entirely free from acid
will not corrode or rust the iron.

PATENT IRON FILLING

A composition or filling for Tools, Machinery,
Engines, Locomotives, Tenders, Iron
Ships, and all ironwork for buildings, inside
or out. Send for sample card, price list and
testimonials.

FELTON, RAU & SIBLEY,

Nos. 136, 138 and 140 N. 4th St., Philadelphia.

Friction Driven Center Grinder.
A neat, simple and cheap
tool to true up centers, will
grind centers up quicker
than they can be turned
and turned, hardened, will
go on any size lathe without
any adjustment. Send for descriptive circular.
ENERGY MFG. CO.,
1115 to 1125 S. 17th Street,
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ANY HARDWARE DEALER

in any place can have all the trade in

BUTCHER SAW BLADES

if he will take the trouble to show the Star Blades to the Butchers and permit them to try their quality. There is not a single place where these Blades have been used that they have not taken and held the market. They can be sold for 10 CENTS each, and that is less than the cost of filing a common saw. They are so hard that one will cut three or four times as long as the saws now in use without filing. As these Saws are not to be filed, and as one only lasts a few months before getting dull, a great many of them are wanted. They are listed on the 50th page of our new Catalogue which we will send on demand.

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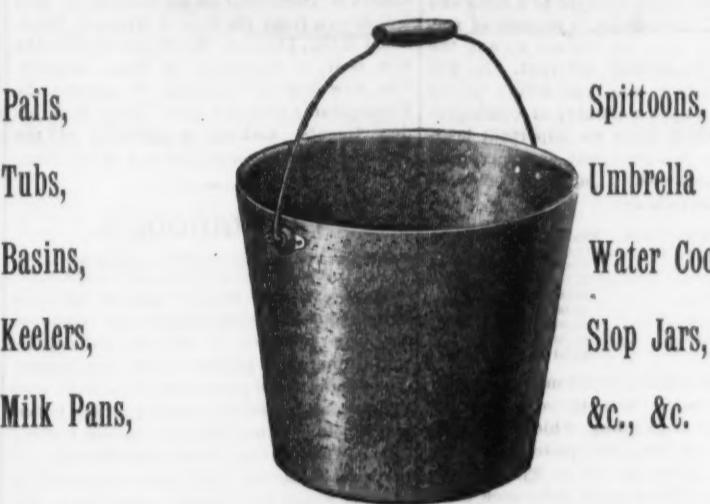
STAR BUTCHER ★ SAW BLADES.

Length.	Width.	Gauge.	Teeth to Inch.	Per Dozen.
14 and 16 in.	1/2 in.	24	9 1/2	\$1.08
18 " 20 "	1/2 "	24	9 1/2	1.20
22 " 24 "	1/4 "	24	9 1/2	1.32



CHAMPLAIN
Forged Horse Nails.
MANUFACTURED BY THE
NATIONAL HORSE NAIL CO.,
 Vergennes, Vermont.
HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST
NORWAY IRON AND WARRANTED.
WAREHOUSE
97 CHAMBERS AND 81 READE STREETS NEW YORK.
J. C. McCARTY & CO. Sole Agents.

INDURATED FIBRE WARE. SEAMLESS



Spittoons,

Umbrella Stands

Water Coolers,

Slop Jars,

&c., &c.

Molded in one piece from wood pulp. Treated chemically, giving great strength and durability, and at same time making the ware impermeable to liquids, hot or cold. Being neither painted nor varnished it will not impart taste to anything put in it, and will not further absorb liquid or odor so as to become heavier or foul. Is very light. Has no hoops to drop or rust off. Warranted absolutely seamless and unaffected by extremes of weather.

EVERY ARTICLE WARRANTED.

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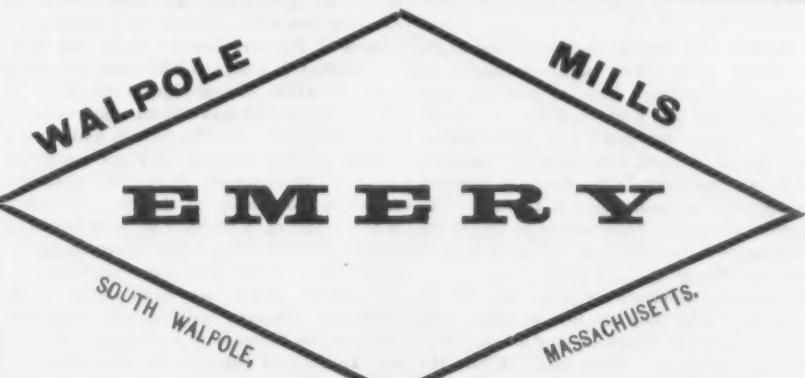
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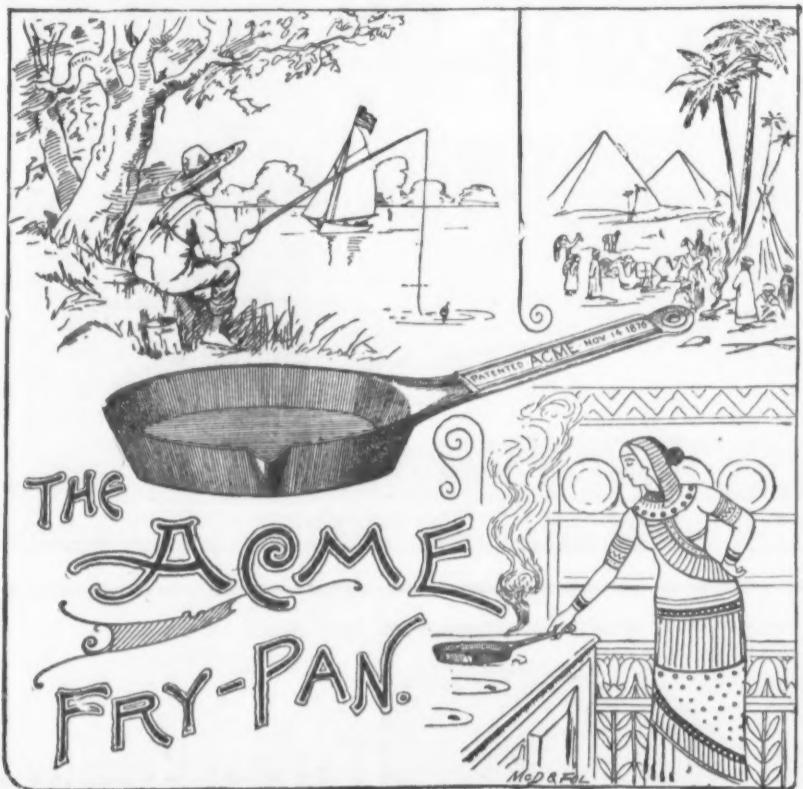
BRASS GOODS MFG. CO.

Manufacturers of Stamped Brass, Silvered and Tin Goods, Hyatt's Patent Brass and Iron Spring Bolts, Bronze and Plated Thimbles, Rosettes, Plate Escutcheons, Socket Shells, &c., Mucilage Brushes, Patent Mirror Pin Cushion Business Cards, Mirrors for Perfume Bottles, Hyatt's Patent Sensors, Safety Pins. Novelties of New Designs made to order.

Salesroom, 88 Chambers St., New York. Factory, 250 to 254 State St., Brooklyn.



'SOLD EVERYWHERE'



THIS unique cooking utensil is made from a single piece of the finest cleaned, and cold rolled iron, without rivets. The handle is reinforced with a tinned iron cover, which is hollow, ventilated, and keeps always cool.

For sale by all Jobbers in Hardware and Tinner's Stock in the United States and Canada.

NEW YORK STAMPING COMP'Y
SOLE MANUFACTURERS,

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Office of A. A. GRIFFING IRON CO.
Sole Manufacturers of Bundy Radiators,
JERSEY CITY, N. J., May 11, 1887.

MR. W. J. LADD,

Dear Sir:—You are entitled to an expression of our opinion in reference to the usefulness of your Discount Book. We beg to say that we have used it a great deal and are more than pleased with it, as it proves an accurate and speedy assistance in computing discounts. It certainly saves much time which otherwise would be lost in figuring, and therefore we do cheerfully recommend the book and believe it should have a place in the office of every man doing even a fair amount of business.

The price you ask, \$2.00 per volume, is no criterion of its worth, and we are free to say that if we could not obtain another copy we would not part with the one we have for many times the amount paid for it. Wishing you every success in the sale of your creditable work, we remain,

Very respectfully yours,

THOS. H. WILLIAMS, President.

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It contains about 120 thousand computations indexed for ready reference, arranged in a convenient form for practical use. It gives at a glance the net of any sum at a great range of discounts, both simple and complex, and it will save you time, money and brains.

PRICE, THREE DOLLARS.

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THE HAGUE PATENT EXPANSION SHOE.

THE BEST SHOE IN THE WORLD.

For all Lameness in Horses' Feet, such as Contraction, Hoofbound, Corns, &c., &c., and cannot become displaced from the wall by the growth of the foot.



This Shoe will Positively Cure Contracted Feet.

J. B. HAGUE & CO., Manufacturers,
NAPOLEON, OHIO.

MANUFACTURING.

Iron and Steel.

All the blast furnaces of the Pennsylvania Steel Company, of Steelton, Pa., with the single exception of No. 2, are in blast, and showing a large production. No. 2 furnace will be blown in as soon as a supply of coke can be had.

The Pittsburgh Steel Casting Company, of Pittsburgh, are candidates for the contract for making the three "steel cast, rough bored and turned 6-inch high power rifle cannon of domestic manufacture," for which an appropriation of \$25,000 was made at the last session of Congress.

Lochiel Furnace, of the Lochiel Furnace Company, of Harrisburg, Pa., has been leased by Robert H. Coleman, proprietor of the Colebrook and Cornwall Anthracite Furnace, at Lebanon, Pa., and will be operated in connection with those furnaces. It will be put in blast as soon as a supply of coke can be had.

A dispatch from Scranton, Pa., dated July 1, says: "The Jersey City Steel Works, through Scranton representatives, yesterday purchased seven acres of land in the Second Ward in this city, on which it is proposed to erect works for the manufacture of mechanic steel and fine tools. The land was purchased from the Delaware, Lackawanna and Western Company, the price paid being \$5000 per acre. The Jersey City Corporation have been negotiating for the purchase of this property since last October. Yesterday the option closed, and the bargain was sealed. The papers were immediately made out and the property paid for, spot cash. The work of erecting the building will begin at once. Nine hundred men will be employed at the start. This will give the steel business in this city an additional impetus, and will, if necessary, add greatly to the city's position as an industrial center."

The South Chicago Works of the North Chicago Rolling Mill Company, which suspended operations for about one week on account of the lack of coke, resulting from the strike in the coke region, are now in full blast, having received a supply of coke adequate for their purposes.

The employees of the Reading Iron Works, at Reading, Pa., decided not to accept the reduction of 10 per cent. made recently, and as a result the entire works are now idle, throwing 2000 men out of work.

Falcon Furnace, owned by Brown, Bunnell & Co., at Youngstown, Ohio, after a shut down of several weeks for repairs, was successfully blown in on the morning of the 1st inst.

A dispatch from Phillipsburg, N. J., dated June 29, says: "All of the Andover Iron Company's furnaces below here are to-day out of blast, and the company suffer a loss of about \$60,000. No. 1 became chilled a few days ago. No. 2 worked badly and was this morning blown out to be torn down and rebuilt. No. 3 is being rebuilt and was to take the place of No. 2 had the latter held cut the balance of the year."

The Montour Rolling Mill, at Danville, Pa., resumed work on the 28th ult., after having been shut down five weeks on account of wage troubles. The mill employs 350 men.

The Sharon Steel Casting Company, of Sharon, Pa., announce to the trade that they are now ready to receive orders for their line of goods for August delivery. The plant of the above company is located at Sharon, and is equipped with the best machinery that could be obtained, which, with the superior force of workmen that has been secured, will enable the company to produce steel castings of an excellent quality.

The works are also equipped with a 25 ton traveling crane furnished by the Morgan Engineering Company, of Alliance, Ohio. The works will have facilities for producing steel castings from the smallest size made up to 15 tons in weight. The parties interested in the enterprise are Samuel McClure, F. H. Buhl, Joseph Riddle and Daniel Eagan, all of Sharon, and B. F. Watkins, of Alliance, Ohio, who was formerly superintendent of the iron and steel foundries of the Morgan Engineering Company, and the Solid Steel Company, of Alliance, and was also connected with the Cambria Iron Company for 12 years as superintendent of the iron and steel foundries of that company. The works will be under the general management of Mr. Eagan, while Mr. Watkins will superintend the running of the same.

The rolling mill at St. Paul, Minn., is now being operated by a new corporation known as the Capital City Rolling Mill Company. Since the mill was started it has passed through several changes, having first been operated by Morgan, Williams & Co., then by the Northwestern Rolling Mill Company, and now by a third combination of owners. It is in active operation at present, but those who are running it say there is no certainty of its continuing at work.

The Portage Iron Company, Limited, of Duncansville, Pa., is about to add to their already extensive plant another new building, which will be 112 feet in length. It will be used for shearing iron and other purposes.

The Ohio & Western Coal and Iron Company, of Columbus, Ohio, have closed a contract with a prominent firm in Pittsburgh for the completion of their two blast furnaces at Floodwood, Ohio. These furnaces are to be raised about 10 feet, giving dimensions of 75 x 17, and will be finished with all of the latest improvements in the way of blast-furnace machinery. Having ample heating, steam and blowing power, it is calculated the output of each furnace will be 125 tons of iron per day when using rich ore and good fuel.

The Illinois Iron and Bolt Company, of Carpentersville, Ill., are putting up a new building 52 x 128 feet in size and one story high for a forge shop, and are getting new machinery for it.

All the furnaces of the Cambria Iron Company, at Johnstown, Pa., have been banked, except one. The company's coke ovens, in

the Connellsburg region, have been shut down for some time, and enough fuel from other sources cannot be obtained to supply the furnaces.

Machinery.

William Tod & Co., of Youngstown, Ohio, have an order for another of their Hamilton blowing engines for a blast furnace in southern Ohio. They also report trade larger than ever on the Porter-Hamilton rolling-mill engine.

A mutual aid society, with 130 members, has been organized by the employees of the Westinghouse Machine Company, of Pittsburgh, with the following officers: John Jackson, president; Joseph Schleicher, vice-president; John May, treasurer, and Larimer W. Jones, secretary.

A new company is being organized in Pittsburgh for the purpose of holding and selling patent rights for electric railway purposes. It is to be called the Overhead Conductor Electric Railway Company, and has a capital stock of \$300,000. Among those interested in it are George Westinghouse, Jr., John Caldwell, H. H. Westinghouse, Frank L. Pope and Thomas B. Kerr. The company's motors, or conductors, instead of being under ground, are to be overhead like telegraph wires. The Observatory Hill electric road and the Mount Oliver electric road will, it is said, operate the patents of this company. It is claimed that this method of conductors is a signal advantage over the underground method, as it prevents them much longer.

A meeting of the creditors of Whately Fassler & Kelly, mower and reaper manufacturers, of Springfield, Ohio, whose suspension was noted in our last issue, was held on the 28th ult. at Springfield. There was a large representation of capitalists present, and the meeting, which terminated at 4 o'clock, was harmonious, and a disposition to give the firm every opportunity was manifest. After claims were filed, Colonel A. L. Conger, of Akron, was made chairman, and J. D. Culbertson, of Wheeling, secretary.

The result of the meeting was the adoption of the following: "Resolved, That we approve the action of the Champion Bar and Knife Company in applying for a receiver for Whately, Fassler & Kelly, and of the appointment of William N. Whately as such receiver, and that M. Churchill, Zanesville; Alexander Gebhardt, Dayton; A. L. Bushnell, city; Walter Peter, Boston; Amos Whately, city, be, and they are, appointed a committee to examine into the affairs of the Whately firm and to report a plan for their adjustment and for the return of their property to Whately, Fassler & Kelly, and the termination of the receivership, and the said committee be directed to make a preliminary report by mail, within 30 days, and to call a meeting or meetings of the creditors before September 1, next, at such times and places as they may deem expedient." Means have been provided for the company to continue their business as usual.

A company has been organized at Chicago under the name of the Chicago Automatic Boiler Company, for the manufacture of a boiler of a new design. M. Cochran Armour is president of the company, W. S. Armour is secretary and treasurer, and G. A. Colby superintendent. Their office is in the Adams Express building, No. 185 Dearborn street.

The Morris Machine Works, of Baldwinville, N. Y., have just issued a catalogue illustrating and describing their new automatic engine. It embraces an extensive table of sizes, weights, speeds and steam pressures.

We have received from the A. Plamondon Mfg. Company, 57 to 67 South Clinton street, Chicago, a copy of their catalogue for 1887, which has just been issued, making their 29th annual catalogue. The company's manufacturers embrace shafting, pulleys, hangers, couplings, machine-molded gearing and machinery for flour mills, grain elevators, distilleries, breweries, &c. The catalogue embraces 157 pages, devoted to descriptions and prices of the various manufacturers, accompanied by a telegraphic cipher code to cheapen the cost of ordering irregular or odd sizes by wire. The company call special attention to their gear list, which they say is the largest bona-fide gear list ever published in this country, containing almost every sized gear needed. They also state that they have three gear molding machines, which make perfect gears of any size or kind, and three gear-dressing machines for dressing both iron and mortise wheels.

The Foos Mfg. Company, of Springfield, Ohio, have secured an order from The Southern Cotton Oil Company, of Charlotte, N. C., to furnish their scientific oil cake crushers and grinders for all the new oil mills to be erected in the South. This is the largest order ever given at one time for such machinery, and involves the largest amount of money. It will require an extra force of men to build the crushers in time for delivery, which will be early the coming fall.

The Wainwright Mfg. Company, of Boston, report shipments of their corrugated tube exhaust feed-water heaters to the following places during the month of June: four to Boston; one to New York City; one each to East Buffalo, N. Y.; Whitman and North Adams, Mass.; Cumberland Mills, Dexter and Bar Harbor, Me.; St. Joseph, Mo.; Decatur, Ill., and Weimar, Texas.

Messrs. Byram & Co., of Detroit, Mich., the exclusive manufacturers of the Collis cupola furnace, have recently made shipment of these furnaces to the Fort Worth Iron Works, Fort Worth, Tex., and the Dustin & Hubbard Mfg. Company, Oakland, Me., and will soon ship their second furnace this season to Messrs. Bement, Miles & Co., of Philadelphia, Pa.

The Chalmers-Speno Company, of New York, were recently awarded a large contract from Boston for their non-conducting covering. The specifications call for some 25,000 feet, or nearly 5 miles, of all asbestos pipe covering.

The Silver & Deming Mfg. Company, of Salem, Ohio, manufacturers of pumps and hydraulic machinery, inform us that they have recently built an addition to their

foundry, which will increase the capacity about 30 per cent. They have also increased their facilities in other directions by adding some new, special machinery, and have an average increase over last year's capacity of about 20 per cent. in the various departments. They further inform us that Messrs. Henion & Hubbell, of 55 and 57 North Clinton street, Chicago, Ill., have been recently appointed general Northwestern agents for the sale of their goods.

The Portland Locomotive Works, of Portland, Me., are building 20 locomotives for the Boston and Maine Railroad Company, and are giving employment to 350 men.

The Taunton Locomotive Works, at Taunton, Mass., will shortly commence the erection of a large addition to their present plant. The new building will be of two stories, and will give about 3000 square feet of extra room, extending 75 feet on High street and into the yard 150 feet.

The Webster, Camp & Lane Machine Company, of Akron, Ohio, have received an order from the Cambria Iron and Steel Company, of Johnstown, Pa., for their Penn Iron Mines, at Vulcan, Mich., for a plant of hoisting machinery consisting of two band friction hoisting drums, 12 feet diameter, 72 inch face, having capacity for 2000 feet of 1½ inch of wire rope. The drums are driven by a 28 x 48 inch automatic engine of 350 horse-power. The aggregate weight of the plant is 105 tons, and the machinery is to be in place by October.

The Link Belt Machinery Company, Nos. 11 to 23 South Jefferson street, Chicago, Ill., have sent us a very interesting catalogue devoted to their various forms of link beltting, sprocket-wheels, pulleys and improved appliances for handling materials. It embraces 176 pages and is profusely illustrated.

The Hagerstown Steam Engine and Machine Company, of Hagerstown, Md., have sent us a number of circulars and a catalogue devoted to their different forms of agricultural machinery, embracing traction, portable and stationary engines, threshers, corn-shellers, clover hullers, saw mills, &c. A large number of illustrations are given, together with descriptive particulars.

We are in receipt, from the Blymyer Iron Works Company, of Cincinnati, Ohio, of three catalogues, the latest bearing the date of March 1, 1887. It is mainly devoted to sorghum and imphie sugar canes; their culture and manufacture into syrup and sugar, and will be found throughout of the greatest interest. Illustrations are given showing different varieties of sorghum sugar canes, together with descriptive particulars. Sorghum culture, syrup and sugar making, and the various details connected with the subject, are treated in successive chapters, and the whole will be found of great interest, even to those not peculiarly interested in the subject. One of the other catalogues is devoted to sugar cane machinery, steam engines, &c. It is profusely illustrated, and contains the information ordinarily found in trade publications. The third catalogue is devoted to ice-making machinery, and illustrates and describes the machines formerly made by the company, and now in the hands of the Cincinnati Ice Machine Company, of Cincinnati.

Hardware.

The works of the New Castle Wire Nail Company, at New Castle, Pa., are reported to be employing 200 hands and turning out 500 kegs of wire nails daily. They are shipping as far east as Massachusetts and as far west as Portland, Ore.

The Wheeling Hinge Company, of Wheeling, W. Va., are now building a two-story brick factory for the accommodation of their strap and T-hinge machinery. The building will enable them to place their machinery to the best advantage, and the addition of new and improved machinery will add largely to their capacity for producing these goods. When they start up it is the intention to make all their hinges of soft steel.

The Clinton Wire Cloth Company, Clinton, Mass., are enlarging their works by the erection of new buildings and enlarging of others. The changes now in progress will add, it is estimated, 10,000,000 feet to its present capacity for weaving wire window screen cloth. An additional story is being put on its No. 3 mill, adding 22,000 square feet floor surface. This will be devoted to looms for weaving window screen cloth, some of the looms being ready to start as soon as the building is completed. As the walls are up but little is to be done except putting the roof on. The old front has been taken down and a handsome new front of brick, with terra cotta and granite trimmings has taken its place. A new storehouse is being erected for the storage of wire and manufactured goods. It is on the line of the Old Colony Railroad, so that cars may be loaded and shipped away with quick dispatch. The floor space available for storage is about 40,000 square feet. The building is to be four stories high and will be as nearly fire-proof as possible. A new galvanizing plant is to be erected this season, which it is intended shall be a model for the work for which it is designed, and no expense will be spared in its construction. It will contain fuel and metal houses, tank rooms and galvanizing pits sufficient for 500,000 feet of netting per day. While this is in excess of the present demand the company are now providing for a large increase of their galvanizing business, following out their policy of producing it at low cost.

The Kelly Axe Mfg. Company, Louisville, Ky., have finally completed their new axe and hatchet factory, at a cost of over \$100,000. The business takes in one entire square of 425 feet, the buildings, built in the most substantial way of brick and iron, covering three-fourths of the space. A private switch for receiving and shipping freight connects the works with all the railroads entering the city. The machinery is all of the most improved pattern. Two batteries of boilers, which can be operated singly or together, furnish the steam power, at an expense of \$4.64 per day of 10 hours work, the consumption of fuel being 6 tons of slack coal, at a cost of 74 cents per ton. Each department is operated by an independent automatic en-

gine, and a stoppage of one does not affect the others. The capacity of the work is 40,000 to 50,000 dozen axes and hatchets per annum.

The Moore & Barnes Mfg. Company, Phoenix, N. Y., near Syracuse, are moving into their new factory, a spacious and well-arranged building. It is of brick, 100 x 40, two stories, with iron roof, well lighted and of handsome appearance. It will be operated by water power from the river, but two boilers are provided in case of necessity. It will be illuminated by electric light. With these increased facilities the company will be in a position to furnish more promptly its varied line of vises, anvils, sash, plumbings' and safety chains, eave trough hangers, &c., a line to which it is expected that further additions will soon be made.

Local file-makers, says the St. Louis *Age of Steel*, are not so busy as heretofore. One factory is still making full time, another half time, while a third is barely "doing something." The fourth has been diverted to the production of hominy knives or beaters, and is pushing this class of trade for all it is worth. Heel files for shoe factories are made to some extent at local works, and afford a pretty good margin of profit. This is because they are extremely difficult to cut. For a set of three \$5 is charged.

The Hoff, Renner & Adam Mfg. Company, Cincinnati, Ohio, about nine months since secured the large three-story brick premises located on Kinney street, near Spring Grove avenue, measuring 200 x 80 feet, which has in the interval been entirely renovated and remodeled to suit the requirements of a manufactory for their crimped-bottom one-piece Coal Hods. Through vexatious delays on the part of the builders of the special machinery ordered by the company they were put to serious loss and inconvenience in being unable to fill orders, which they were led to accept under the assurance that the machinery would be completed when promised. This machinery has been received, and is now in perfect operation, enabling the company to turn out 2000 complete Hods per day of 10 hours. The principal advantage claimed for this Hod is that the body and bottom are of one single piece of sheet steel; the bottom, in the course of manufacturing, is crimped so as to form a triple thickness. This, together with the novel method of attaching the foot without the use of rivets, combines, it is claimed, to make it very substantial and neat in appearance. The first floor of the new factory is devoted to engine and boiler rooms, and japanning department. One-half of the second floor (80 x 100 feet) is occupied by the special machinery used in the manufacture of the Hods. The remainder of this floor, 80 x 100 feet, is used for shipping, receiving, weighing and office purposes, while a portion of the third floor is used as a general metal worker's and machine shop, and the balance for the storage of Steel used in the manufacture of the Hods and the finished product. A galvanizing department has been added to the establishment, which is located in a separate building, 75 x 30 feet, and has a capacity for galvanizing 800 Hods per day. A reorganization of the company was effected on the 24th ult., John Garlick retiring from the office of vice-president, and R. Park succeeding him in that position, Peter Renner being re-elected to the office of president and general manager; Henry Adam, treasurer; Chas. Hoff, superintendent, and N. R. Park, secretary.

MISCELLANEOUS.

The Hostetter Coke Company, of Pittsburgh, capital stock \$6000, was chartered last week, with Thomas H. Given, Charles B. McLean and W. W. Patrick, of Pittsburgh; Jesse H. Lippincott, of New York, and Arthur White, of London, England, as directors.

The Western Pennsylvania Exposition Society, of Pittsburgh, was chartered on the 28th ult., under the act passed at the last session of the legislature giving such companies the right of eminent domain. The directors are J. J. Gillespie, John Bindley, C. O. Scull, M. Rosenbaum, S. S. Marvin, J. T. Speer, A. P. Burchfield, H. J. Hinze, W. F. McCook, E. J. Unger, H. Buhl, Jr., B. Lupton and D. C. Herbst.

At a meeting of the stockholders of the Chartiers Valley Natural Gas Company, of Pittsburgh, held in that city on the 30th ult., the capital stock was increased \$1,000,000, making it \$4,000,000 in all. The money will be used in improving the plant.

Col John A. Price, President of the Scranton Stove Works, who last week started on a voyage of rest and recreation, intending to travel through Western Europe, has never been very active in the councils of the trade, but he has been a successful business man and a fertile inventor. Most of his inventions have had an immediate commercial value, and have been designed to meet a want existing and recognized. In May, 1867, Colonel Price patented an improved low closet, for ranges, and in June, 1868, a design for ranges. In January, 1869, he patented a shute slide for parlor stoves; in June, 1870, a combined door and hearth; in April and July, 1878, the well-known construction known as the Dock-ash grate; in February and March, 1879, other forms of stove grates; in January, 1882, and May, 1883, a valuable improvement in furnace grates; in May, 1883, a range closet; in the same month a bi-mantel shelf; in August, 1883, a further improvement in furnace grates; in September, 1883, a range shelf; in February, 1884, two forms of furnace grates; in December, 1884, and February, 1885, various forms of water heaters; in February, 1885, a furnace grate; in July, 1885, an oven for ranges; in December, 1885, a new furnace construction; in January, 1886, a stove door; in December, 1886, a range closet; in February, 1887, a stove design; in May last a complete, but very simple and effective, water gas producer, and in June a ventilated oven construction in cook stoves. We have not searched the record so carefully as to be sure there are not some omitted from this list, but those enumerated we happen to

know about. Many of these inventions have been largely successful, and have tended materially to promote progress in the arts to which they relate. As Colonel Price is still a young man, and has scarcely reached the period of maximum intellectual activity, we may expect that his record as a fertile and useful inventor will be something exceptional. Indeed it is already.

It is reported that Gen. E. Burd Grubb, of Philadelphia, Robert Garrett, of the Baltimore and Ohio Railroad Company, and Howard Munckhuyzen, of Baltimore, have purchased 2000 acres of the estate of John Carroll, in Baltimore County, Md., paying \$200,000. The tract is underlaid with rich iron ore, which will be mined, and is covered with valuable hard woods.

Among the companies recently securing licenses for incorporation in Illinois are the following: The Eagle Horseshoe Nail Company, of Chicago; capital, \$150,000; organized to manufacture horseshoe nails; incorporators, J. A. Johanson, August Johnson and J. P. Wonnerstem. Chicago Natural Gas Fuel and Light Company, of Chicago; for the development and production of natural gas; capital, \$1,000,000; incorporators, C. G. Goodwin, John C. Schurtz, R. A. Wade, A. H. Armour, John T. Nichols, S. R. Burke and George C. Armstrong.

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CHANDLER'S ICE-CUTTING MACHINE.



Any piece of ice that will go into the hopper will go through, being drawn in by the peculiar shape of the teeth. This arrangement is fully protected by letters patent, and cannot be used on other cutters.

Also, make Four other Sizes:

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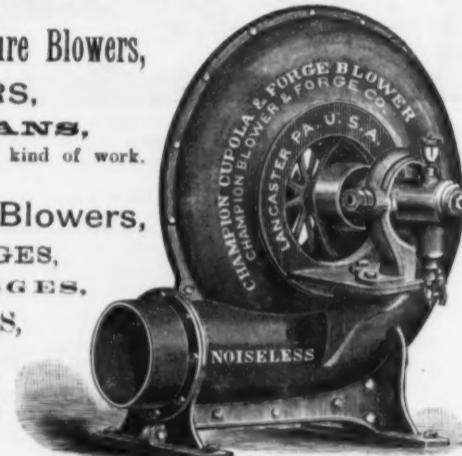
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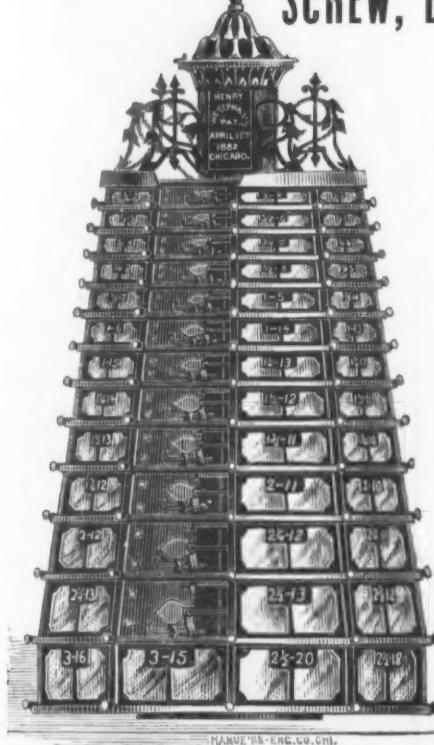
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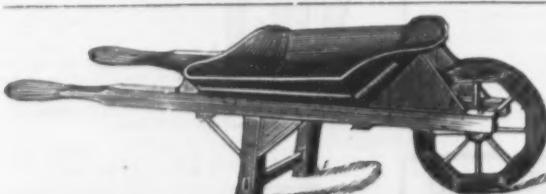
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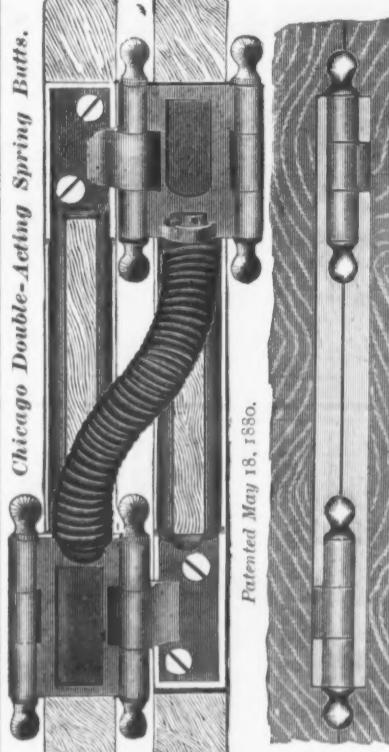
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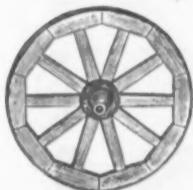
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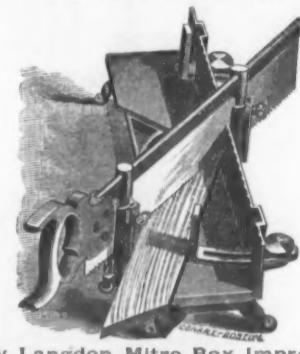
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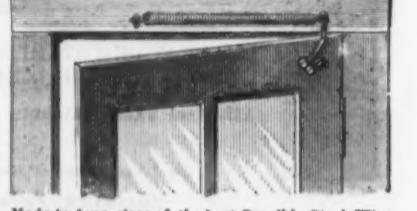
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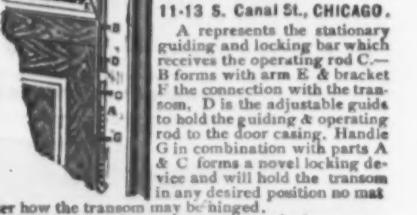


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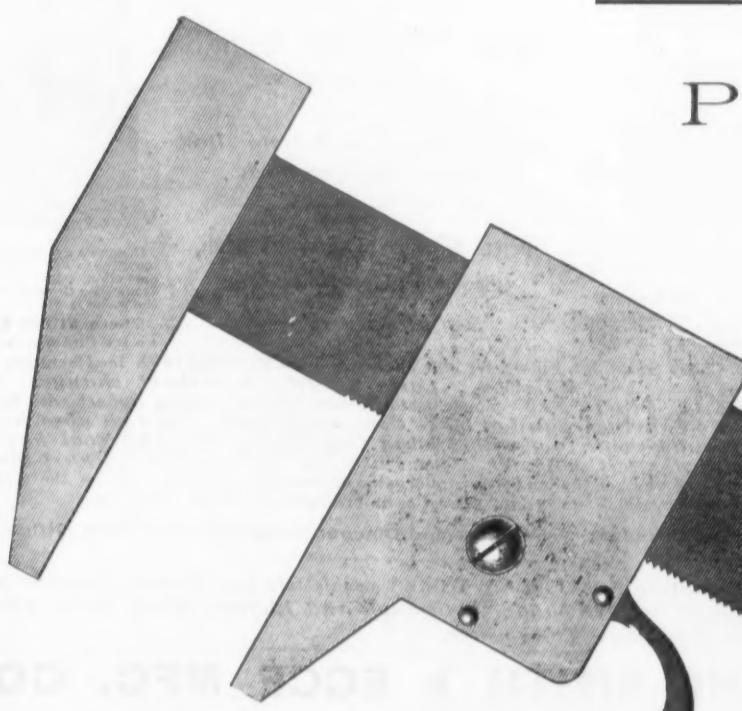
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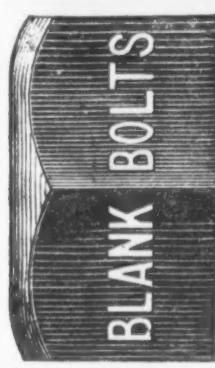
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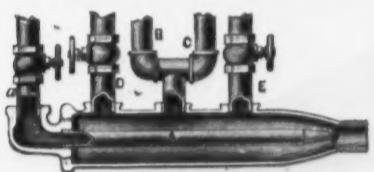
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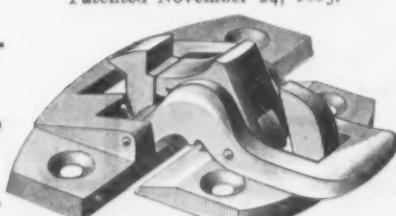
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"Extra Heavy" for handling Ores, Coal, Broken Stone, &c.

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Jobbers and Retailers of
Heavy and
SHIP CHANDLERY HARDWARE,

Tackle Blocks and Cordage,
267 Federal St., Boston, Mass.
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Gate City Stone Filter Co.,

Office and Salesroom at
46 Murray Street,

Manufactory and D-pot at
UNION PORCELAIN WORKS,
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Impure Water is Poison. Best
Filter ever Invented.

Price \$3.75 to \$41.25 each,
according to size and style.

This open cut represents our Stoneware Filters in operation, showing the stone Disc through which the water is filtered.

These Filters have
no Ice Chambers.

Cheap Stone Jar Filters for the kitchen. Fine Porcelain (with Ice Chambers) for dining-rooms, halls and offices. Lasts a lifetime without change. NO METAL USED. All common metals generate poison when in contact with water. NO Charcoal, Sand or other Compound used. They all absorb, retain and become foul with Living Organisms. Charcoal has no chemical effect on water. Our Filtering Medium is a Natural Stone. No matter whether the impurities are organic or inorganic, they are left on the surface of the stone, which is as easily cleaned as an ordinary water pail or pitcher.

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THE UNION PORCELAIN WORKS manufacture Hard Porcelain Insulators, large and small, for Telephone, Telegraph and Electric Work, Door Plates and Hardware Trimmings.

THE SMITH & EGGE MFG. CO.,
BRIDGEPORT, CONN.



Giant



THE GIANT PAD LOCK.

Centennial Award. Superior in Every Respect. This is one of the best selling locks in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very handsome in appearance, and every Lock is warranted. Orders solicited.

THE GIANT METAL SASH CHAIN

is a substitute for cord in hanging weights to windows. It is manufactured by us only, and by automatic machinery, patented and owned exclusively by ourselves, and whereby we secure uniformity of construction and quality. We have been to great expense in producing a metal having all the qualities and conditions requisite for making suitable chain for this purpose, and to prevent other chain of the same pattern of link and of the same general appearance, but made from an inferior metal, being offered as the same thing, we patented the word "Giant" as a Trade-Mark, as applied to either metal or chain. Trade-Mark Registered April 16, 1876, and October 22, 1878, and our metal is therefore known in the market as "Giant Metal," and our chain as "Giant Metal Sash Chain."

ROMER & COMPANY, Manufacturers of PATENT JAIL LOCKS, BRASS and IRON PADLOCKS,



DASH AND CARRIAGE LAMPS,
LANTERNS,

Patent Horizontal Rim Cylinder Reversible Night Latches.

Illustrated Lists sent to the Trade on application.

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THE SYRACUSE TWIST DRILL BIT. (For Wood.)

This tool is designed to meet the needs of CARRIAGE and CABINET MAKERS. It is also specially adapted to REPAIR WORK and THE BEST FARMERS' BIT in the market.

1. It is made of the BEST STEEL.
2. It is ACCURATE IN SIZE.
3. It can be FURNISHED BY $\frac{1}{64}$ ths of an inch if desired.
4. It can be SHARPENED ON A GRINDSTONE.
5. It WILL NOT SPLIT THE WOOD.
6. It WILL CUT OFF NAILS.
7. It will make a STRAIGHT HOLE.
8. It will REAM OUT A HOLE.

MANUFACTURED BY
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BAR IRON,
BAR STEEL,
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STEEL BILLETS.

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MANUFACTURERS OF
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SMALL T RAILS,
FLAT RAILS
OF IRON OR STEEL
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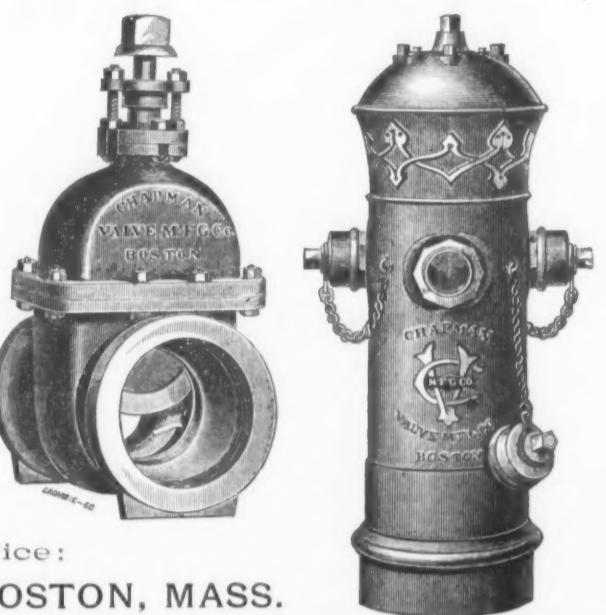
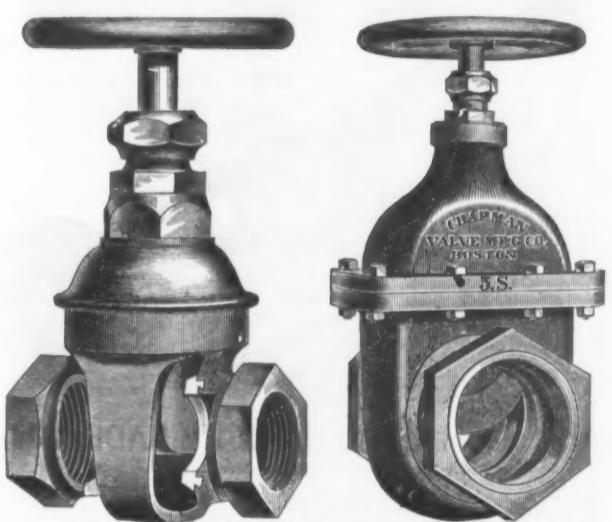
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FOR
STEAM, WATER, GAS, AMMONIA.

GATE FIRE HYDRANTS,

With and Without Independent Nozzle Valves.



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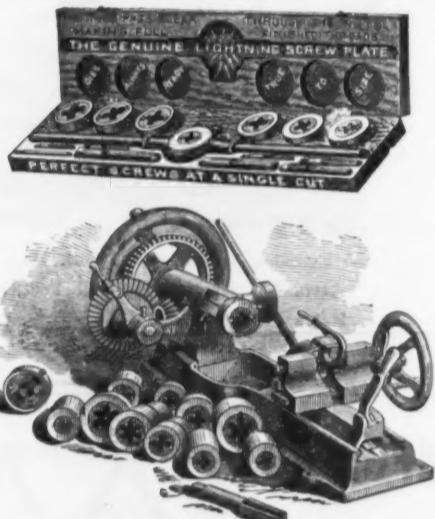
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NEW GREEN RIVER

*Upright Tire-Shrinker,
IMPROVED.*



Green River Tire-Shrinker.
Horizontal No. 1.



No. 10 Bolt Cutter.—For the Bench.

—European Agents—**Messrs. SELIG, SONNENTHAL & CO., London.**

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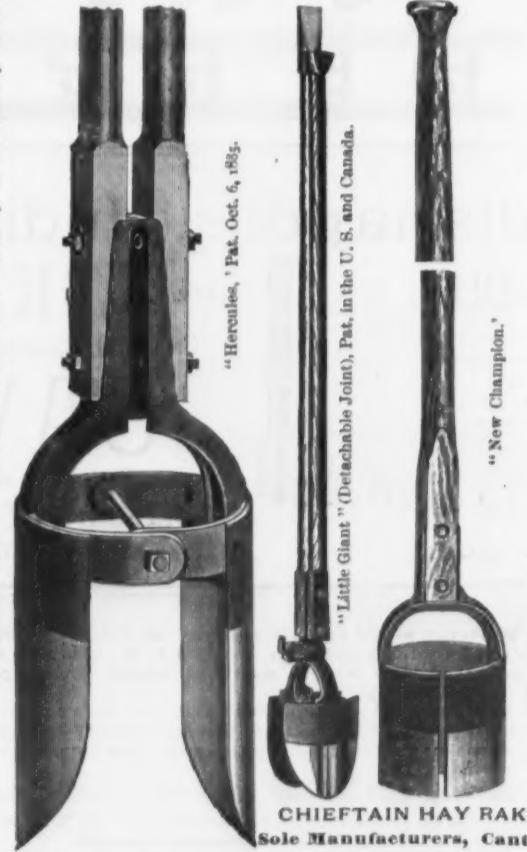


No. 20 Bolt Cutter.—For Bench.



No. 0.—For Tires $\frac{3}{8} \times 2$ inch.
No. 2.—For Tires 1×4 inch.

KOHLER'S POST HOLE DIGGERS.



"Hercules," Pat. Oct. 6, 1885.

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"Nest" Digger.

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Sole Manufacturers, Canton, Ohio.

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Please remember our line of manufacture. We are Headquarter for Hand and Wheel Dump Haulies, Hay Tedders, Hay Forks, Little Giant, Hercules and New Champion Post Hole Diggers, Portable Tree Protectors, and Automatic Extension Step Ladders. Our Goods are not equalled by any on the market.

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PATENT SPOOL WIRE FOR THE RETAIL HARDWARE TRADE.

Dealers who handle it do away with the BROKEN BUNDLE BUSINESS and sell small quantities by the spool only. It is a convenience for both dealer and consumer. It is SHELLAC COATED and CANNOT RUST. It is wound like spool cotton on QUARTER POUND, HALF POUND and ONE POUND Spools, one dozen spools in a box.

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SPECIAL WIRES FOR MANUFACTURING PURPOSES ON ANY SIZE OF SPOOL.

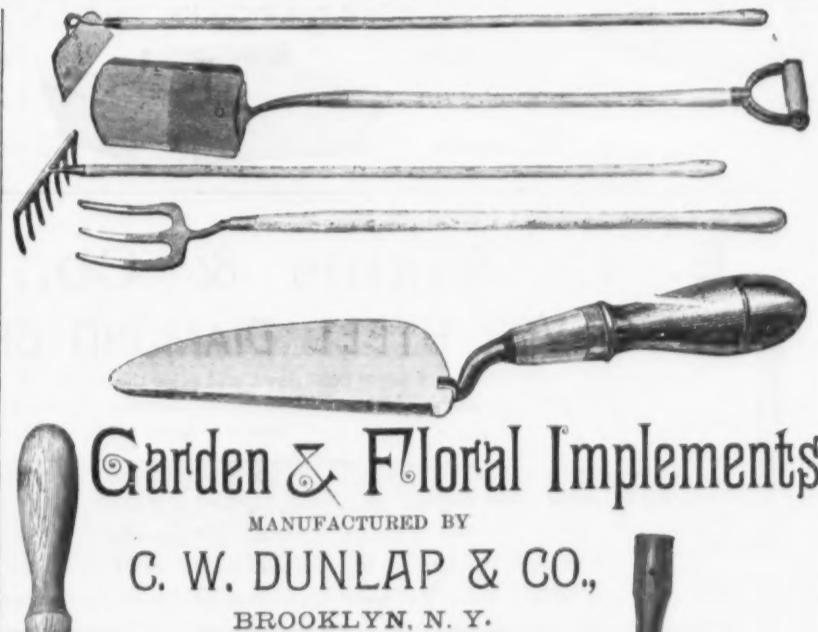
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We make a larger variety of these goods than any other manufacturer in the United States.

All Goods Made to a Standard.
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Axes and Edge Tools,

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BROWNING,
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Manufacture
Belt Hooks
Cotters,
Spring Keys,
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and everything
pertaining to wire
bending.

FACTORY,
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IRON LEVELS.

Sliding Nut Calipers.

Screw with Sliding Nut easily attached to old Calipers or Dividers.

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The great and unprecedented success of the PENNSYLVANIA LAWN MOWER has induced manufacturers of other Lawn Mowers to imitate our open cylinder. Not being able to use the Patents upon which our knives are formed, they all make a bungling attempt to try and accomplish the same result, in trying to secure the same cutting edge on the knives by a different shaped edge which after being in use a short time, reduces the edge of the knife to cause great friction, and without securing the desired results.

**1887.
PENNSYLVANIA
LAWN MOWER.**

Has No Equal,

Surpassing All Others

AND PRONOUNCED

"THE BEST."

Illustrated Price Lists sent upon application.

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**PENNSYLVANIA HORSE LAWN MOWER.—Open Cylinder.**

Showing Mower with Seat and Spring, Shafts and Handles. Draft Irons Detached.
Width of cut 30 inches. Weight, 320 lbs.



Horse Mower, Open Cylinder, 30 inch Cut, with Handles and Draft Irons, \$110.00
Extra for Seat, Spring and Foot Board, \$8.00 | Extra for Seats, \$7.00
recommend the Mower with Draft Irons only. Discount on Horse Mowers of same as on Hand Mowers.

"QUAKER CITY."

The trade will soon find an ordinary and roughly-made Reel of blades and stationary knife is not all that is required to make a perfect Lawn Mower.

**THE
QUAKER CITY LAWN MOWER.
1887.**

**THE QUAKER CITY
Reduced in Price.**

NOW WHY BUY A WORTHLESS MOWER?

Send for Circular.

LLOYD & SUPPLEE HDW. CO., Philadelphia.
J. C. McCARTY & CO., New York.

"CONTINENTAL."

DOUBLE GEAR.

The Cylinder Knives are solid cast steel, made by a patented process; are hardened and tempered in oil, self-sharpening, and never require a file or stone after leaving the factory. All the bearings are long, so that the wear on the Mower will be slow, and oil seldom required. It is made to run at high speed, and will not only cut higher grass, but leaves the lawn perfectly smooth.

**Continental Lawn Mower.
1887.**

**LIGHTEST RUNNING
—AND—
SWIFTEST CUTTING.**

CONTINENTAL LAWN MOWER CO., PHILADELPHIA.

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W. J. KINSEY, Buffalo, N. Y.
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PENNSYLVANIA HORSE LAWN MOWER.—Closed Cylinder.

Horse Mower, Closed Cylinder, 30 inch Cut, with Handles and Draft Irons. Price, \$100.00
Extra for Seat, Spring and Foot Board, \$8.00
Extra for Shafts, 7.00
Discount on Horse Mowers is not same as on Hand Mowers.

TUCKER & DORSEY MFG. CO.,

MANUFACTURERS OF

Woodenware and Hardware Specialties,

INDIANAPOLIS, IND., U. S. A.

Write for
Special Dis-
counts

To Jobbers,
and, notice
next issue.

E. C. Atkins & Co., Indianapolis, Indiana.

SILVER STEEL DIAMOND CROSS-CUT.

We are the sole manufacturers of Silver Steel Saws, and enjoy the distinction of not only having first introduced the best Saws, among which are the Champion, Diamond and Dexter, but of improving and maintaining the quality of Saws to a degree which challenges comparison.

Ground substantially uniform gauge on the toothed edge, and any gauge required on the back.

shape or of heavier weight than the patterns call for. It is astonishing to notice how much extra weight can be (and often is) added to a casting by a careless, incompetent moulder, rushing out piece work at starvation wages! This is generally overlooked by buyers of cheap (?) castings.

We have lately had the unsolicited testimony from a customer in London, to whom we had shipped some light iron castings, that his workmen were able to finish our castings in one-third the time they required to do the same work on castings from similar patterns made in England!

We have facilities for wood and metal pattern making, drilling, polishing, plating, lapping and the manufacture of hardware and light machines by contract.

Machinery Castings, Light or Heavy. Low Prices on Large Contracts.

Freight paid to principal points in New England and New York. Correspondence Solicited.

SPRINGFIELD FOUNDRY CO., 93 Liberty St., Springfield, Mass.
Boston Office, 141A Milk St.

H. F. LIVERMORE, Agent.

Gray Iron and Brass Castings.

To those who are in the market for Castings:

We should be pleased to have you send us drawings, cuts or sketches, or preferably samples of the castings you are using and allow us to quote you our prices. It would be still better to forward patterns with a small trial order on which we will agree to make a satisfactory price. We are confident of our ability to produce castings of the finest quality known to the trade at reasonable prices. We use only the best obtainable materials and approved modern appliances. We employ only steady and intelligent skilled workmen, paying them good wages. While this may make our castings cost more per pound than those of cheap material and poor workmanship, we will guarantee ours to be much less expensive to the user in the end, because of their proper weight and the time and labor saved in the drilling, planing, turning, filing or other finishing. We prefer the reputation of being a high-priced house which does only the very best work to the name of a cheap producer of rough, hard and low-priced castings, out of

ILLINOIS WIRE NAIL CO., CHICAGO,

**MANUFACTURERS,
224 and 226 No. Union St.**



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J. M. BETTON Sales Manager.

THE WAINWRIGHT MAN'G CO.

Nos. 65 and 67 Oliver Street,
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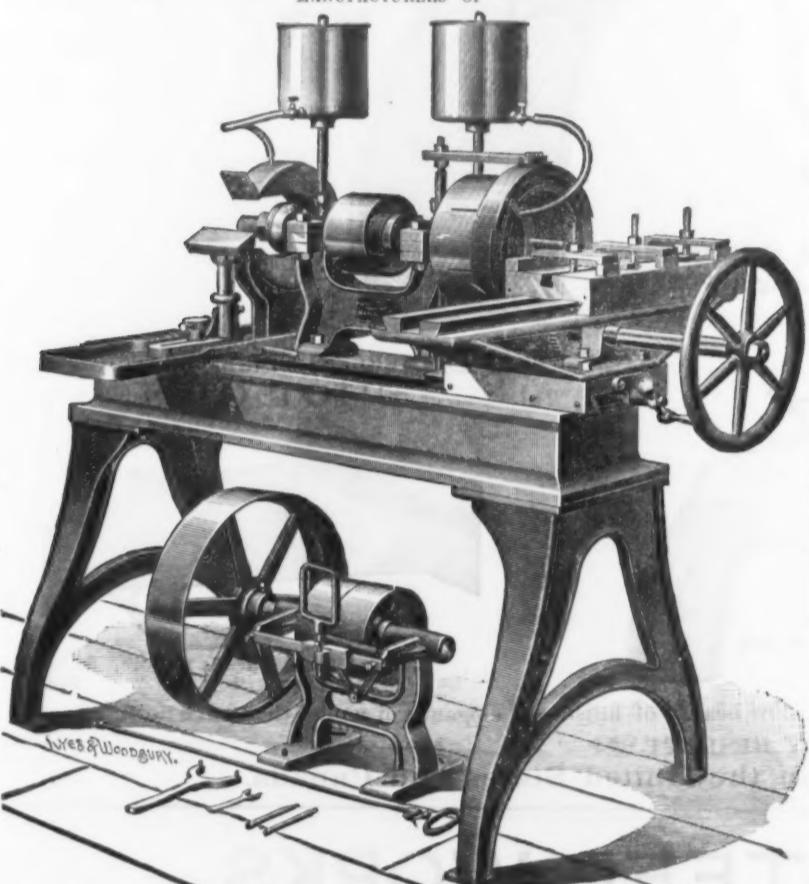
No. 93 Liberty Street,
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The Wainwright Expansion Joint is constructed of corrugated copper seamless drawn tubing, which possesses great longitudinal flexibility, and absorbs the strain caused by the expansion and contraction. It is fitted at both ends with screw or flanged surfaces, for connection. These Joints are positive, doing away with Stuffing Boxes and packing.

Manufacturers of CORRUGATED TUBING, EXPANSION JOINTS, FEED-WATER HEATERS, CONDENSERS, FILTERS, and RADIATORS

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Northampton Emery Wheel Co.,
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EMERY WHEELS AND EMERY WHEEL MACHINERY
OF BEST QUALITY.
FACTORY AT LEEDS, MASS.

Send for Catalogue.

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AWN MOWER**
MANUFACTURED BY
MAST FOOS & CO.
SPRINGFIELD, O.

The Lightest Running,
Most Durable and
Far Surpassing all
other Machines made
10, 12, 14 and 16 inch cut.

ALSO MANUFACTURERS OF THE
Buckeye Hose Reel and Lawn
Sprinkler, Buckeye Wrought
Iron Fencing, Buckeye
Force Pump,
—AND—
Iron Turbine Wind Engines

SEND FOR CIRCULAR AND PRICE LIST.

THE NEW EASY LAWN MOWER.

The leading mower in the
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Front Cut. Steel. Open
Roller Traction. Easy
and Noiseless in
Operation

The only mower that will
cut Wet Grass, Narrow
Borders, and close to walls
and fences. Warranted in
every particular.



Medium Size "NEW EASY."

The T. H. Bullock,
BELLows The Best for
the Money.
CLEVELAND, OHIO.

LAWN MOWER.

The New Model

Our Latest & Best

MOWER.

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MASS. OF EVERY DESCRIPTION.

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SPRINGFIELD GLUE AND EMERY WHEEL CO.

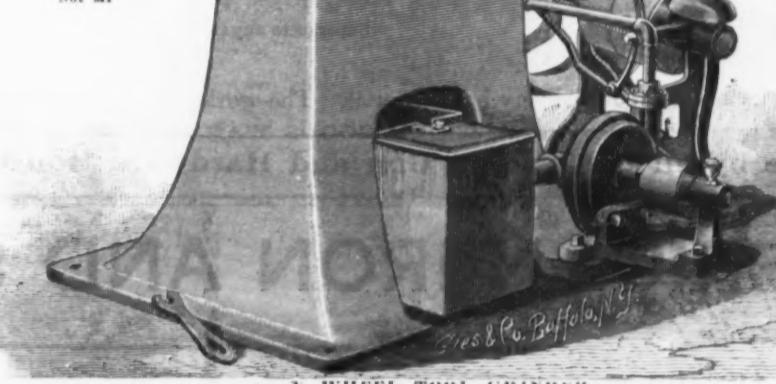
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THE WORK.

Will ship on their merits for 30
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55 Styles and Sizes
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adapted or almost any
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Patented Sept. 25, 1883,
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Write for
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Y WHEEL TOOL GRINDER.

One Thousand for Our Grinders
Now in Use.

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Sole Manufacturers of the

CELEBRATED

Weimer Blowing Engines.

"RIVAL"

Lawn Sprinkler.

Cheapest and best in use

The water from it covers an area of over 1000 square feet of ground, and will work with lower pressure than any other sprinkler in the world, the size of spray depending on the adjustment of acorn and pressure of water; also it can dry or muddy water as well as clear. It has no revolving parts to wear out or small holes to stop up.

To operate, screw the Sprinkler on end of hose, stick the rod into ground in a vertical position, and is ready for use.

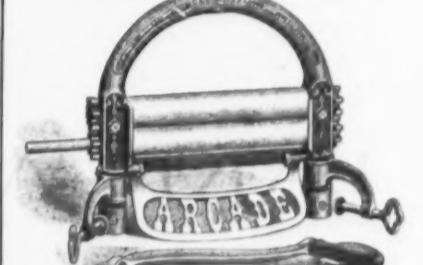
To make a coarse or fine spray turn the adjustable acorn on top. This Sprinkler makes the most beautiful spray, and requires no attention, and is sold at a price within the reach of all.

Price \$7.50 per dozen.
Liberal discount to the trade.

Patent No. 313,311.

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CINCINNATI, O.

THE LATEST AND BEST.



Quality Guaranteed, and the only
Perfectly Automatic Clothes
Wrinkler ever produced.

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The Arcade Machine Co., Cleveland, Ohio.

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BUFFALO SCALES
STANDARD FIRST PREMIUM
AWARDED FIRST PREMIUM
AT THE WORLD'S EXPOSITION, New Orleans,
1884. Gold Medal.
The Best Standard Scales for General
Trading, Weighing, Platform
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BEST VALUE FOR YOUR MONEY.
The Buffalo Scale Company, BUFFALO, N.Y.

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The FRED. J. MEYERS MFG. CO.,

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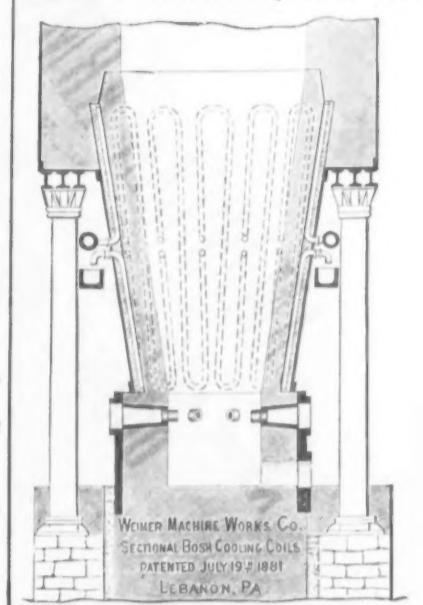
Mixer, Measurer, Weigher, Scoop,
Fruit, Starch and Wine Strainer, Rice
Washer, Egg Beater. Also, Hunter's
and Electric Light Sifters.

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Company,
LEBANON, PA.

DEVOTED EXCLUSIVELY TO
BLAST FURNACE EQUIPMENT.



SECTIONAL BLAST COOLING COILS
PATENTED JULY 19, 1881
LEBANON, PA.

Patent No. 313,311.

Productions of the American Arms Co., Boston, Mass., U. S. A.

AMERICAN ARMS CO.'S
NEW AUTOMATIC,
(S. & W. Model.)
DOUBLE ACTION REVOLVER,
SHELL EJECTING.



AMERICAN ARMS CO.'S
Double Action, 38 Cal., Ring Shell Extracting REVOLVER.



Superior to any shell extracting revolver in the market (not automatic.)

All goods manufactured by us are made of the very best material. The workmanship is first-class. For beauty of finish and elegance of model they have no equal.

ALL OUR GOODS WARRANTED IN EVERY RESPECT.

For Sale by all the leading Gun and Hardware Houses in the United States and Canada.

The Latest and Best
IN THE MARKET.

Using the S. & W. Central Fire Cartridges.
32 AND 38 CAL., C. F.

AMERICAN ARMS CO.'S
SINGLE ACTION, 38 Cal., Ring Shell Extracting REVOLVER.



Superior to any shell extracting revolver in the market
(not automatic.)

SEMI-HAMMERLESS, SINGLE BREECH-LOADING
SHOT GUN.



Retail Prices. { Twist Barrel, 12 bore, \$15.00.
" " 10 " 18.00.

AMERICAN IRON AND STEEL WORKS.

JONES & LAUGHLINS

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LAKE AND CANAL STREETS, - CHICAGO,

MANUFACTURERS OF

STEEL NAILS

Merchant Bar, Band, Hoop and Sheet Iron Chains, Spikes, Bolts, Rivets,

BESSEMER STEEL,

BEAMS, CHANNELS, ANGLES, TEES, PLATES, &c.

Cold Rolled Shafting

WORKS AT PITTSBURGH, PA.

PHILADELPHIA.

Lloyd & Sonnies Hardware Co.
Terms, 60 days. For 60 or 90 days, interest added at
8 per cent. per annum.

Anvils.

Peter Wright's, \$100.00
Trenton, \$100.00
Eagle Anvils, American, 100...
4 lbs. 20 @ 20.82 \$

Axes.

Junct Kentucky and Yankee, 20 lbs. net....\$7.25
William Mann, 20 lbs. net....\$7.25
Favorite 20 lbs. net....\$7.25
Devonshire, 20 lbs. net....\$7.25
Jubilee Axe, 20 lbs. net....\$12.00 @ 13.00
Loveland Axes....7.00

Augers and Auger Bits.—New List January 7, 1880.

Snell's Augers and Bits, 20 lbs. net....\$6.00 @ 6.82 \$
New Snell's Auger Bit, 20 lbs. net....\$6.00 @ 6.82 \$
Benjamin Price Auger Bits, 20 lbs. net....\$6.00 @ 6.82 \$
Ennings' Auger Bits, new list, Jan. 1, 1884, 20 lbs. net....\$6.00 @ 6.82 \$
Cook's Auger Bits and Augers, 20 lbs. net....\$6.00 @ 6.82 \$
Watson's Auger Bits, 20 lbs. net....\$6.00 @ 6.82 \$
Bonney's Pat. Hol. Augers, list \$48 \$100 dis. 40% @ 10 \$
Stearns Pat. Hol. Augers, list \$48 \$100 dis. 40% @ 10 \$
Sterns Pat. Hol. Augers, list \$48 \$100 dis. 40% @ 10 \$

Balances.

Light and Common.....dis. 50 %

Bells.

Sevin Bros. Mfg. Co. Light Hand Bells dis. 75@10% \$
Sevin Pattern Hand Bells.....dis. 20@10% \$
Connell's Door Bells, 20 lbs. net....dis. 20@10% \$
Gt. Western & Kentucky Cow. new list, dis. 70@70@10%

Boring Machines.

Upright, without Augers, List, \$5.75....dis. 50 %
Angular, without Augers, List, 6.75....dis. 50 %

Bolts.—Eastern Carriage Bolts, new list, June 10, 1880.

Brass, 10 lbs. net....\$10.00 @ 10% \$
Phila., Wrought Shutter, 10 lbs. net....\$10.00 @ 10% \$
Stanley, Wrought Shutter, 10 lbs. net....\$10.00 @ 10% \$

Braces.—Barber's Improved, 20 lbs. net....\$10.00 @ 10% \$

Barber's Old Style, 20 lbs. net....\$10.00 @ 10% \$
Backus, Polished, 20 lbs. net....\$10.00 @ 10% \$
Backus, Collected, 20 lbs. net....\$10.00 @ 10% \$
Sporford, 20 lbs. net....\$10.00 @ 10% \$
American Ball, 20 lbs. net....\$10.00 @ 10% \$
Amidon Improved, 20 lbs. net....\$10.00 @ 10% \$
Amidon Corner Brace, 20 lbs. net....\$10.00 @ 10% \$

Butts.

Cast Fast Joint, Narrow, 20 lbs. net....\$10.00 @ 10% \$
Cast Fast Joint, Broad, 20 lbs. net....\$10.00 @ 10% \$
Cast Loose Joint, Narrow, 20 lbs. net....\$10.00 @ 10% \$
Cast Loose Joint, Broad, 20 lbs. net....\$10.00 @ 10% \$
Cast Acorn, Loose Pin, 20 lbs. net....\$10.00 @ 10% \$
Cast Acorn, Tight Pin, 20 lbs. net....\$10.00 @ 10% \$
Cast Mayer's Loose Joint, 20 lbs. net....\$10.00 @ 10% \$
Wrought Loose Pin, 20 lbs. net....\$10.00 @ 10% \$
Wrought Table Hinges and Back Flaps, 20 lbs. net....\$10.00 @ 10% \$
Wrought Loose Joint, 20 lbs. net....\$10.00 @ 10% \$
Wrought Narrow Fast, 20 lbs. net....\$10.00 @ 10% \$

Blind Butts.

Parker, 20 lbs. net....\$10.00 @ 10% \$
Clark, 20 lbs. net....\$10.00 @ 10% \$
Shepard, 20 lbs. net....\$10.00 @ 10% \$
Lath & Porter, 20 lbs. net....\$10.00 @ 10% \$
Hudson, 20 lbs. net....\$10.00 @ 10% \$

Casters.—Bed (new list July 8, 1880) Plate, 20 lbs. net....\$10.00 @ 10% \$

Chains.—German Halter and Coll. list, June 1884
dis. 50 %
Galvanized Pump, 20 lbs. net....\$10.00 @ 10% \$

Best Proof Coil Chain—English.

Best Proof Coil Chain—English, 20 lbs. net....\$10.00 @ 10% \$
Per doz. 5.50 @ 5.25 \$

Chisels.—Socket Framing, 20 lbs. net....\$10.00 @ 10% \$

Socket Firmer, 20 lbs. net....\$10.00 @ 10% \$
Butcher's, 20 lbs. net....\$10.00 @ 10% \$

Coffee Mills.—Box and Side (new list Jan. 1, 1880).

Enterprise, 20 lbs. net....\$10.00 @ 10% \$
Enterprises, 20 lbs. net....\$10.00 @ 10% \$

Cutlery.—Walton Pocket.

Walton Pocket, 20 lbs. net....\$10.00 @ 10% \$

Furniture Knives.

Hart Mfg. Co., 20 lbs. net....\$10.00 @ 10% \$
Adjustable Handle, 20 lbs. net....\$10.00 @ 10% \$

Files.

Nicholson, 20 lbs. net....\$10.00 @ 10% \$
Dixon, 20 lbs. net....\$10.00 @ 10% \$
Cronin and Arrow, 20 lbs. net....\$10.00 @ 10% \$

Fluting Machines.

Eagle, 20 lbs. net....each, \$2.18 \$
Eagle, 5 lbs. in. roll, each, \$2.85 \$
Crown, 20 lbs. net....each, 4.00 \$
Crown, 5 lbs. in. roll, each, 4.50 \$
Crown—8, 20 lbs. net....each, 5.50 \$
Geneva Fluter, 20 lbs. net....each, 5.50 \$
Favorite comb. Fluter and Sad Iron, 20 lbs. net....each, 5.50 \$

Fry Pans.

Surprise, 20 lbs. net....dis. 50 %
Per doz. \$5.00 3.75 4.25 4.75 5.25 6.00 7.00 8.00 9.00
No. 1 2 3 4 5 6 7 8 9 10

Hammers.

Yerkes & Plumb's, new list, 20 lbs. net....dis. 40% @ 10% \$
Mayhew Hammer, new list, 20 lbs. net....dis. 40% @ 10% \$
Hornell A. E. Nail Hammer, 20 lbs. net....\$10.00 @ 10% \$

Handles.

Dixon Loop Handles Cross-Cut, 200 pair net....\$10.00 @ 10% \$

Boynton Loop Handles Cross-Cut, 200 pair net....\$10.00 @ 10% \$

Hatches.

Yerkes & Plumb, new list, 20 lbs. net....dis. 40% @ 10% \$
Huni, 20 lbs. net....dis. 40% @ 10% \$

Hay and Straw Knives.

Lightning, 20 lbs. net....\$18.00 dis. 25 %

Electric.

Electric, 20 lbs. net....\$18.00 dis. 25 %

Wadsworth.

Wadsworth, 20 lbs. net....\$18.00 dis. 25 %

Wood Saw Knives.

Wood Saw Knives, 20 lbs. net....\$18.00 dis. 25 %

Gem Hay Knife.

Gem Hay Knife, 20 lbs. net....\$12.00 dis. 25 %

Hinges.

Strap and T., 20 lbs. net....dis. 40% @ 10% \$

Hoops.

Hoops, 20 lbs. net....dis. 40% @ 10% \$

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JAMES P WITHEROW, Engineer & Contractor

LEWIS BLOCK,

PITTSBURGH, PENNSYLVANIA,

GENERAL AGENT FOR

WHITWELL FIRE-BRICK STOVES

AND

Clapp-Griffiths Patents for Manufacture of Soft Steel,

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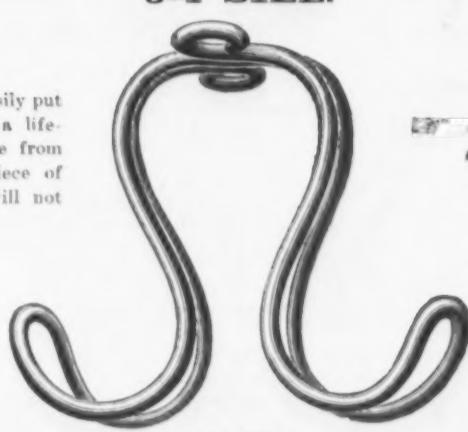
Will contract to completely erect, equip and place in operation Blast Furnace Whitwell Stoves and Steel Plants as above. As I manufacture at our own works everything appertaining to Blast Furnace and Steel Works construction, can guarantee promptness and satisfaction.



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THE INDESTRUCTIBLE CEILING HOOK, 3-4 SIZE.



This Hook is easily put up and will last a lifetime, as it is made from one continuous piece of Steel Wire and will not break or bend.

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THE PERKINS AND BRADLEY MFG. CO.,

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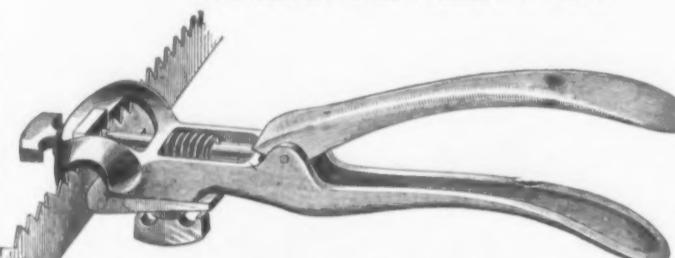
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MORRILL'S PERFECT SAW SETS AND BENCH STOP.

FOR SETTING EVERY VARIETY OF SAWS



For price lists
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The Union Land Co., of St. Paul, with a paid-up capital of \$2,000,000, owning magnificent manufacturing sites located in St. Paul, on the Mississippi River, with two trunk lines of railroad passing through its property, is prepared to offer great inducements to manufacturers in the way of free sites and money at low rates of interest, and the backing of a powerful company. The trade of 4,000,000 people is tributary to this point, affording the greatest opportunity for successful manufacturing. The workings of the Interstate Commerce bill will render Eastern competition practically out of the question.

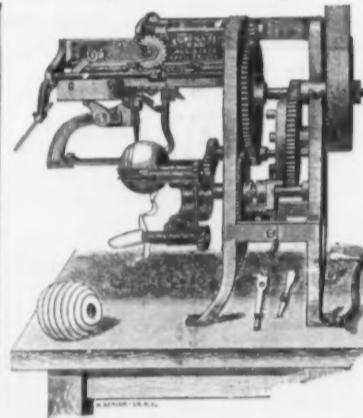
For particulars, address

UNION LAND CO. OF ST. PAUL,

St. Paul, Minn.

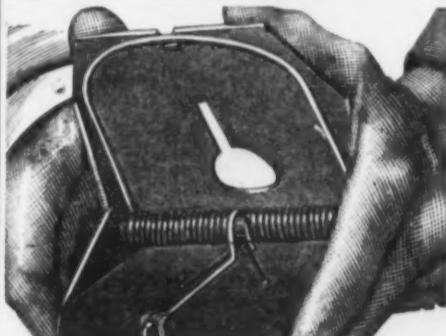
Eureka '86 Apple Paring, Coring and Slicing Machine.

Unrivaled for durability, speed and quality of work performed. Works automatically. Pares, Cores and Slices twenty-five Apples per minute. Pares and Cores without slicing. Can be used by hand or power. Does better and more work than any other Parer in existence. No Evaporating Establishment is complete without them.



It is the only successful Power Apple Parer in the market and cannot be surpassed. Does all that is required of it perfectly. Easy to operate and adjust. "Strongest, fastest, most complete and finest working machine on earth." Retail price, \$20. Send for circular. We make Apple Parers of all descriptions. Catalogue furnished on application.

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HOTCHKISS IMPROVED RAT KILLER

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E. S. HOTCHKISS,
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Absolutely Free from Danger in Setting.

Cut Shows Trap BEING SET.

Send for Illustrated List.

Sample by Mail for 25 Cents.

SOLID SPOUT MINERS LAMP.



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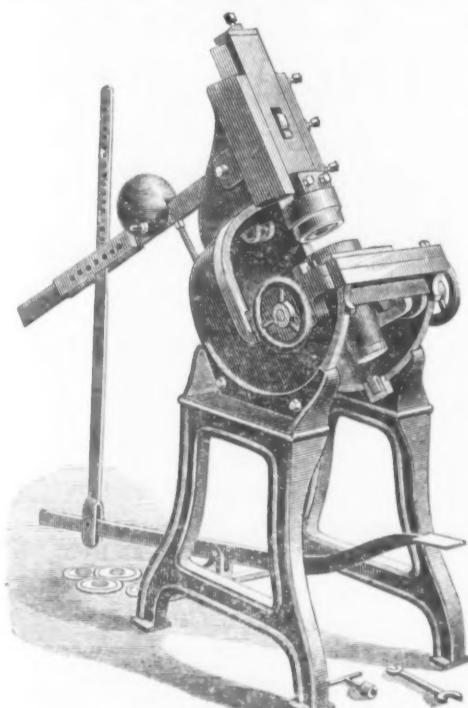
Office, 14 W. German St., BALTIMORE.



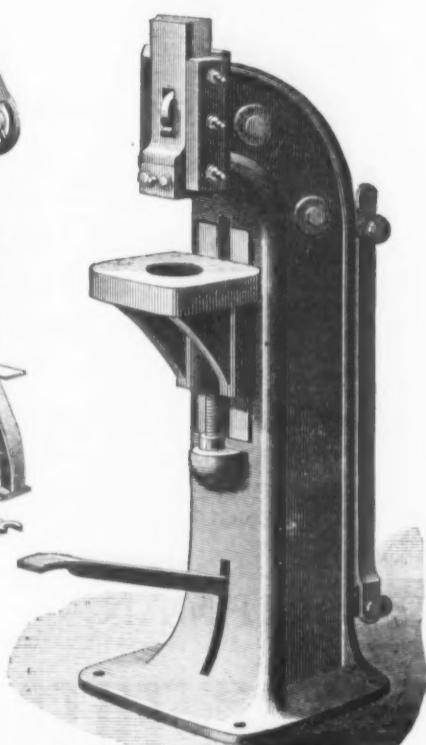
E. W. BLISS CO.,

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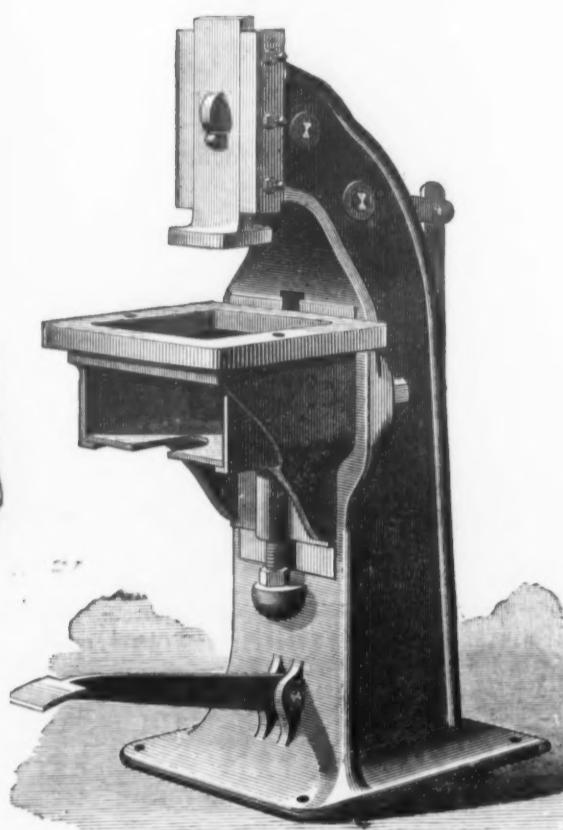
Brooklyn, N. Y.



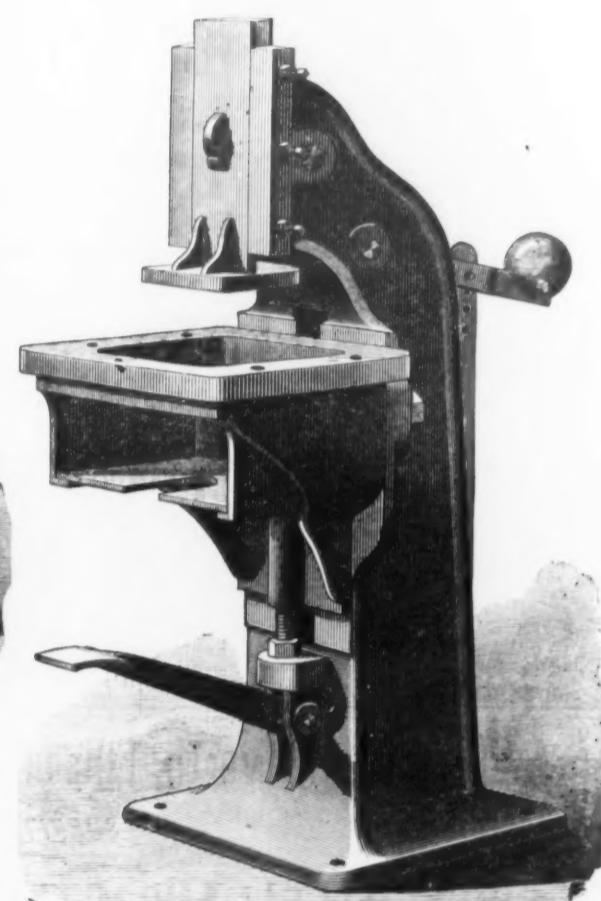
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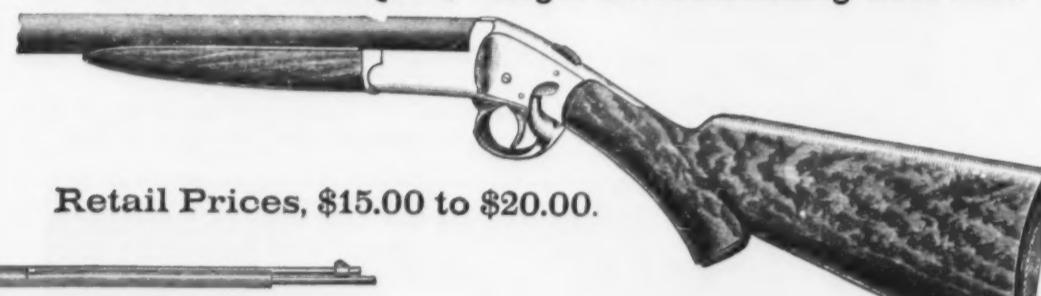
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Retail Prices, \$15.00 to \$20.00.



Hammerless "Champion," Single Breech-Loading Shot Gun.



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SHOOTS DARTS AND SLUGS.

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GIANT HAND-CUFFS, AS THEY APPEAR ON THE WRISTS.

Impossible for the Prisoner to remove them from his wrist either with or without the key.

SIDE SNAP "CHAMPION"
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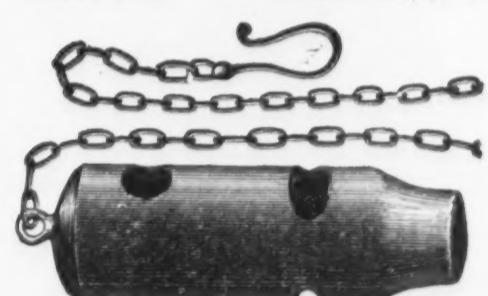


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WEIGHT, 3 OZS.

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This is the only Call manufactured that is devoted exclusively to Police use.



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Manufacturers of Champion Single Guns, Double and Single Action Revolvers, Air Rifles, Air Pistols, Bean's Police Goods.

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Have established and maintained their reputation, for superiority, against all Competitors, for
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**R. MUSHET'S SPECIAL STEEL
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Turns out at least double work by increased speed and feed, and cuts harder metals than any other steel. Neither hardening nor tempering required.

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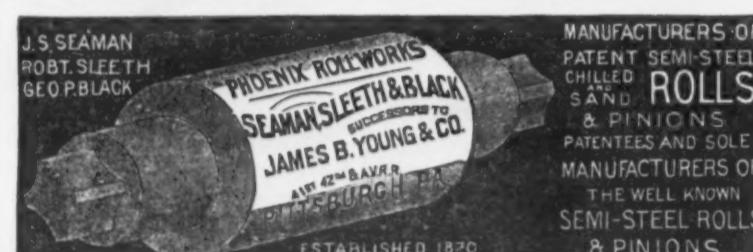
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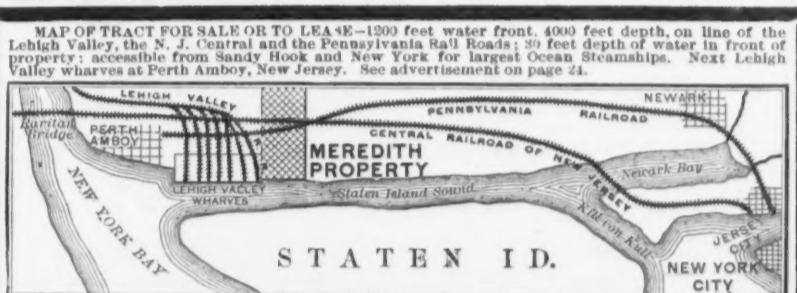
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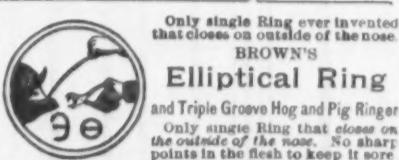


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The Best in the Market. Why?

1st. It is so constructed that the Rubber can never get out of the barrel without taking out the lock-pin.

2d. It differs from all other Rubber Window Cleaners, for when the edge of the rubber slips, it is only necessary by simply taking the pin out and reversing the edge of the rubber slip and pushing the pin in again, to have a new Window Rubber.

3d. It can be used twice again by taking the lock pin out and turning your rubber, using the near edge of the rubber slip and placing it for the outside, then reverse the whole and again you will have equal to other Rubber Cleaners.

When the four edges are worn smooth and worthless you can get at any hardware store a two-inch strip of rubber for a few cents and put it back in itself. It is so simple that any child can do it.

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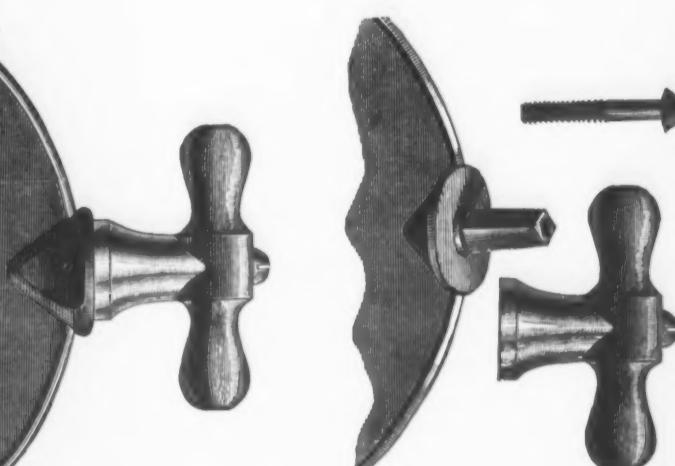
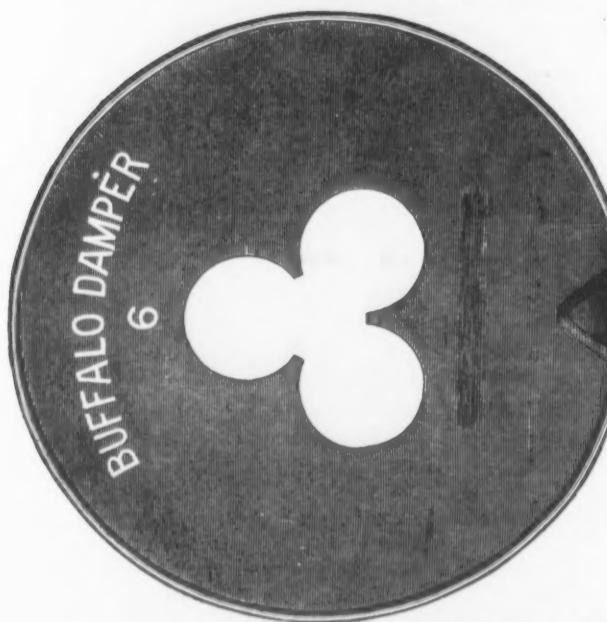
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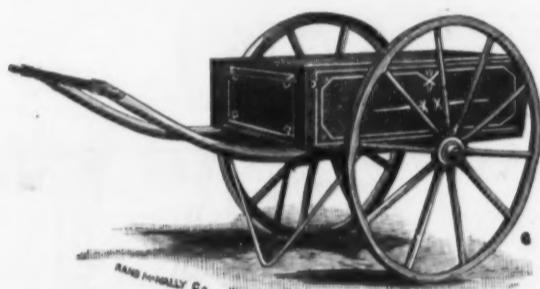
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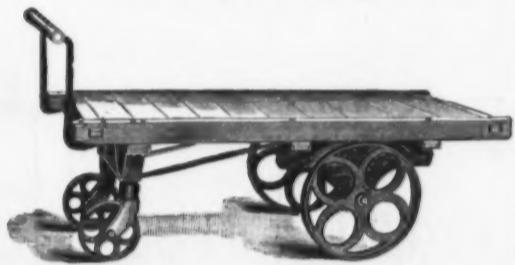
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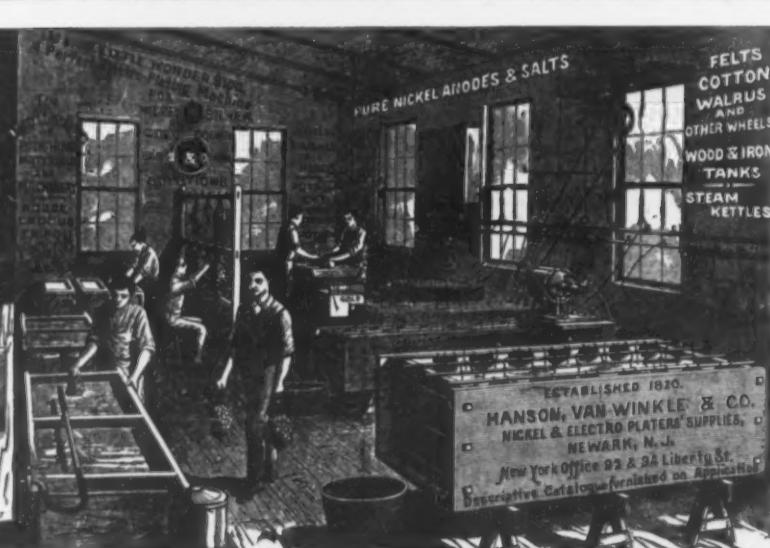
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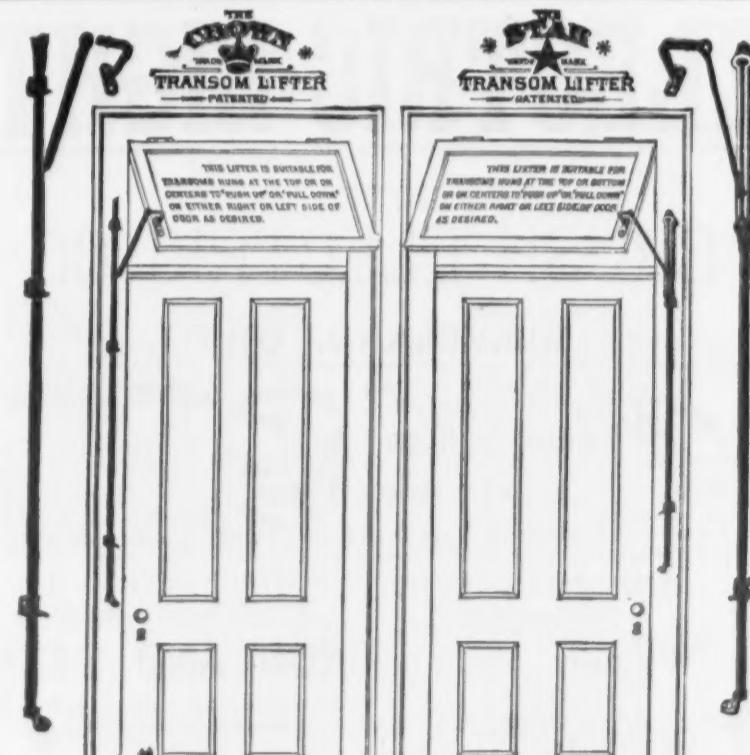
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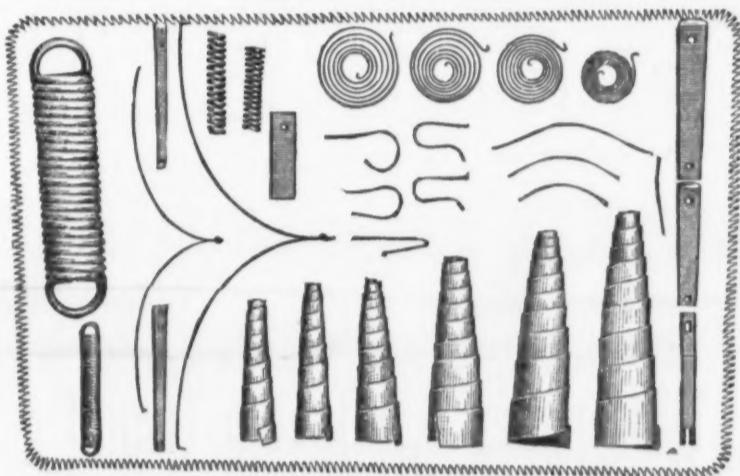
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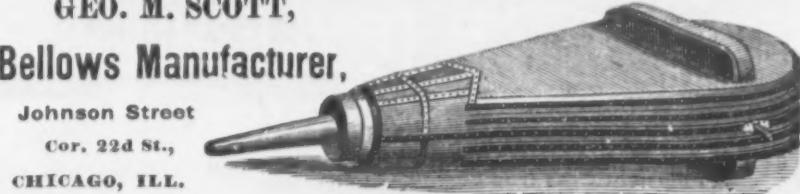
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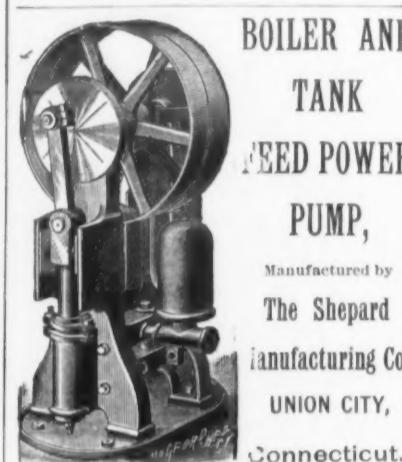
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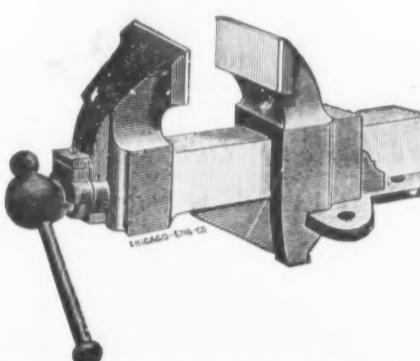
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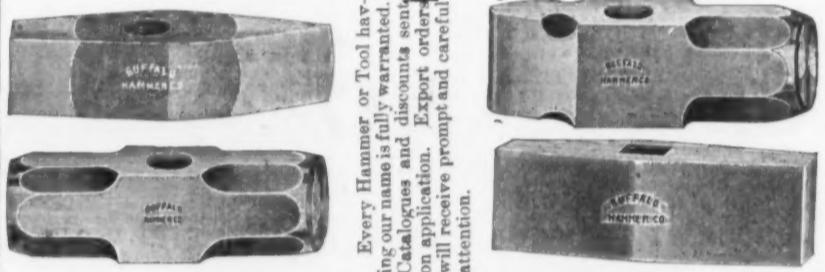
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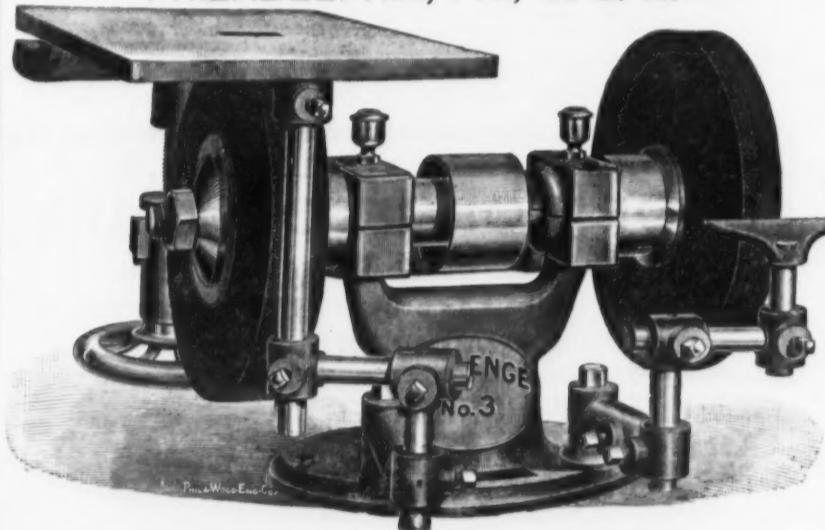
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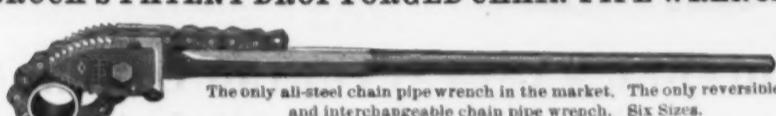
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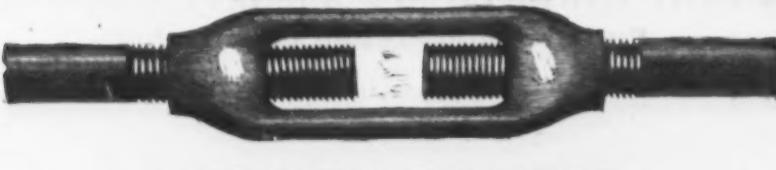
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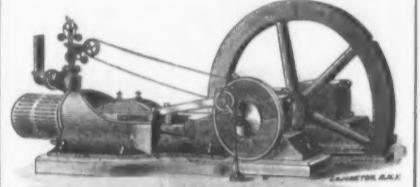
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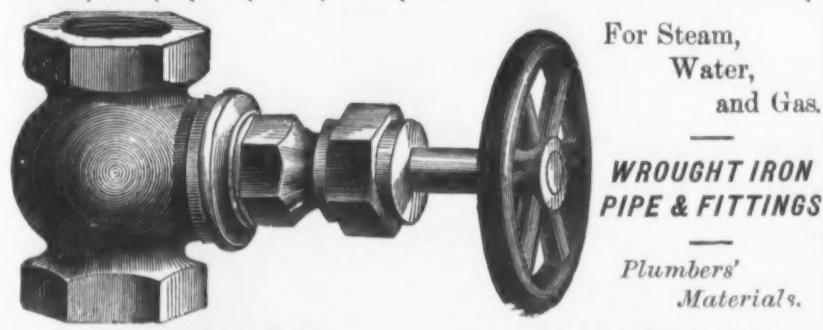
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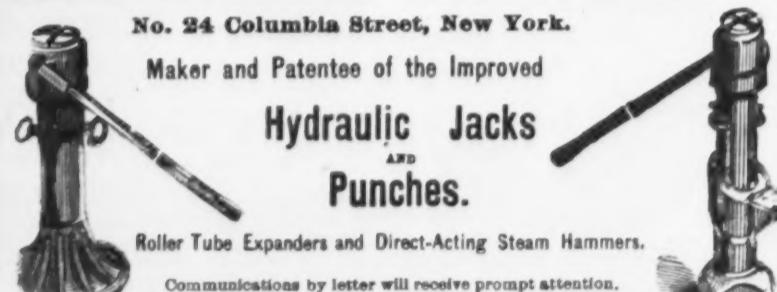
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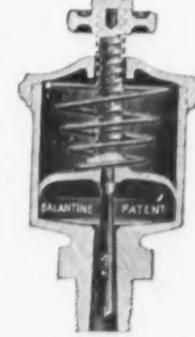
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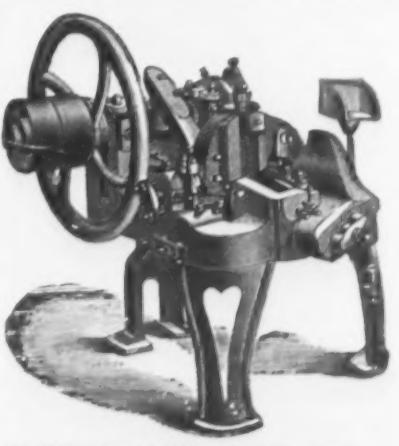
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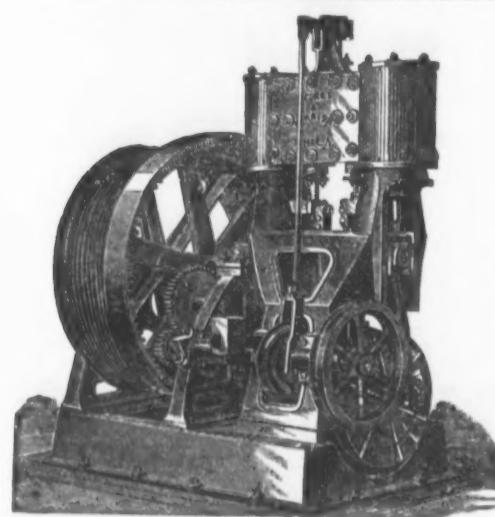


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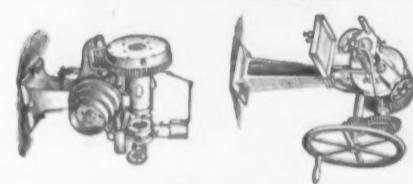
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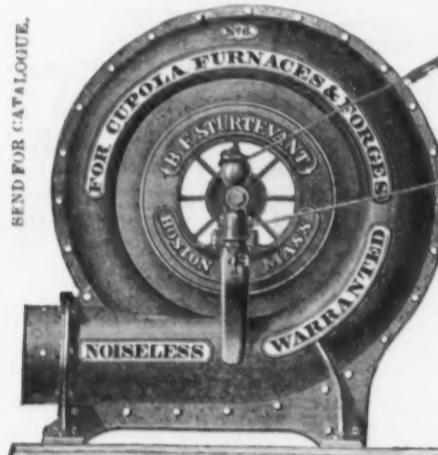


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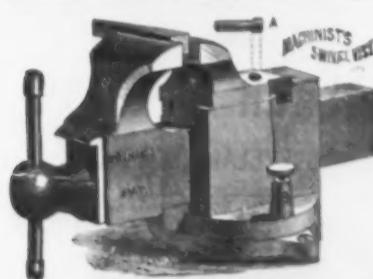


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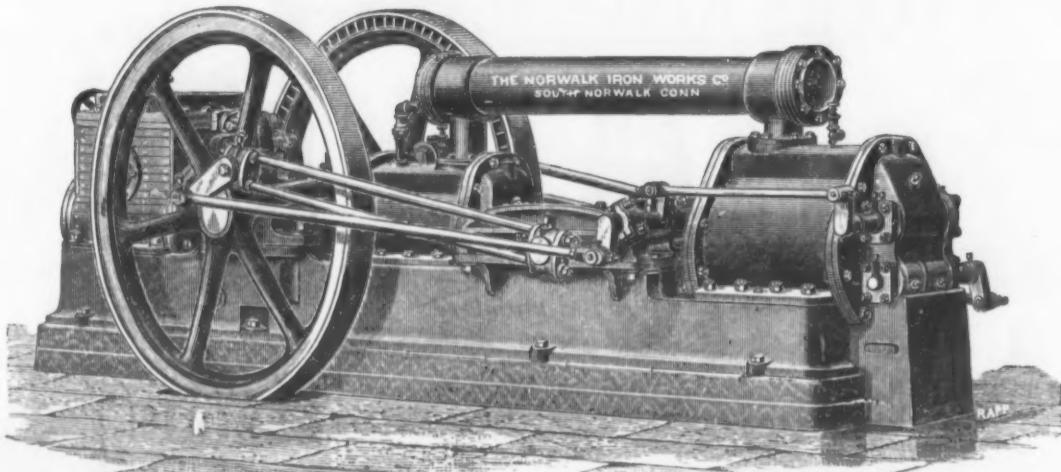


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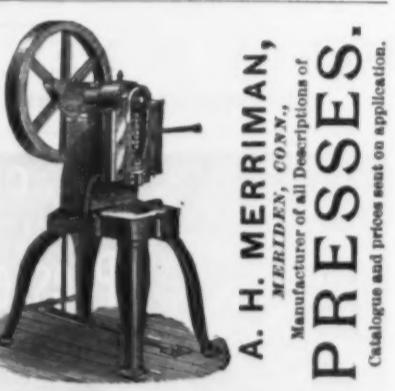
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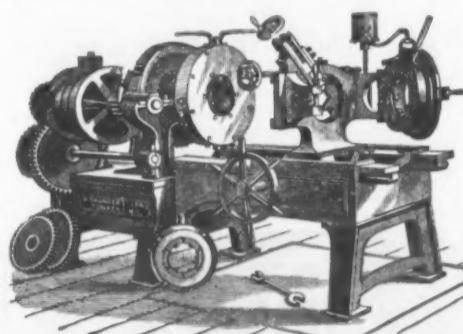
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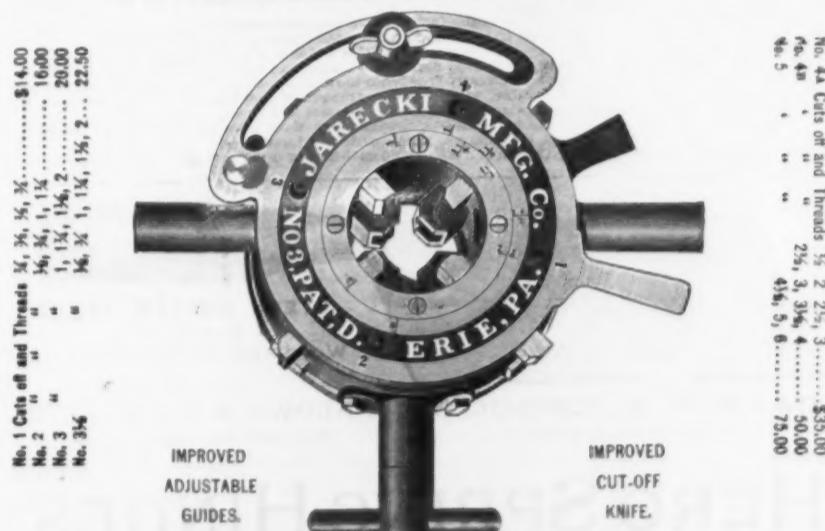
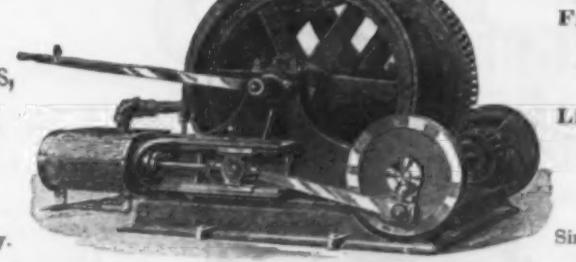
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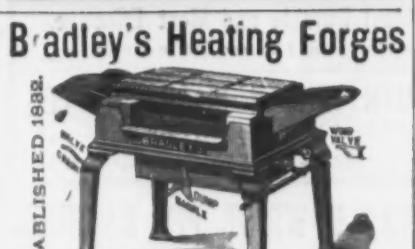


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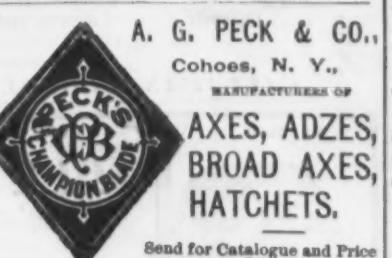
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